



MANUFACTURING OF DAIRY FARMING



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ADDIS ABEBA CITY ADMINISTRATION INVESTMENT COMMISSION

PROJECT PROFILE ON DAIRY FARMING

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I. EXECUTIVE SUMMARY

This project profile is prepared to assess the viability of running Dairy farming business, in Addis Abeba city administration. Hence Market, Technical, Organizational and Financial study was made to investigate the viability of the envisaged project.

This project profile on Dairy farming has been developed to support the decision –making process based on a cost benefit analysis of the actual project viability. This profile includes marketing study, production and financial analysis, which are utilized to assist the decision-makers when determining if the business concept is viable. Ethiopia has a private sector driven dairy farming. According to the latest data sourced from Ethiopian investment commission there are more than 252 companies were registered to invest on dairy farming business in Ethiopia and 62 companies are on operational stage while others are on implementation and pre-implementation stages.

The location of the plant will be decided on the basis of access to materials input, infrastructure namely power, water, transport and telecom to easy access to international market. The most locally available raw materials for dairy farming are feed and medicine maize. This dairy sector investment opportunity brief highlights the investors or Promoters of The company for the establishment of this a dairy farming facility to produce milk products that have an extended shelf life. The project will have assumed to be produce 10,000 liters per day of raw milk.

The total investment capital including establishing the factory is Birr 178.62 million. Out of the total investment capital, the owners will cover Birr 53.58 million (30 %) while the remaining balances amounting to Birr 125.04 million (70 %) will be secured from bank in the form of term

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loan.

As indicated in the financial study, the cash flow projection of the project shows surplus from the first year on. The net cash flows of the project range from Birr 42 Million in the first year to Birr 272 million at the end of the 10th year of operation. At the end of the 10th year of operation period the cumulative cash balance reaches Birr 1.3 billion birr. The Benefit-cost ratio and Net present value (NPV) have been calculated at 17% discount factor (D.F) for 10 years of the project activity. Accordingly, the project has NPV of 646 million Birr at 17%D.F. and the benefit-cost ratio of 2.98 at 17% D.F.

Therefore, from the aforementioned overall market technical and financial analysis we can conclude that the dairy farming business is a viable and worthwhile.

1. Background information

1.1. Introduction

Ethiopia is reported to be gifted with the largest livestock population in Africa. Ethiopia has also the largest number of milking cows in Africa, with 56.71 million cattle of which over 11.46 % are dairy cows. It ranks first in Africa and 9th from the world. Dairy has been identified as a priority area for the Government, which aims to increase Ethiopian milk production. In line with, the Government has projected to increase the national cow milk production by 93%, as a result of the proposed interventions, during the GTP II (Second Growth & Transformation plan); period (2015–2020) is 93%, a surplus of 2501 million liters over projected domestic consumption requirements. This surplus of milk can then be substituted for imported milk products and used domestically for new or additional industrial uses, or exported as milk powder or UHT to raise foreign exchange earnings.

A future milk surplus could be realized through investment in better genetics, feed and health services, improving both traditional dairy farms and commercial-scale specialized dairy production units. The Government is actively supporting the private sector to produce UHT milk and is making supporting investments in supply-chain infrastructure, training, and improved breeds, and dairy-focused Agricultural Commercialization Clusters (ACCs). Ethiopia has close proximity to large regional consumers of milk such as Sudan and Kenya, as well as to the Middle East markets. Milk production and processing business have become the key industry in Ethiopia as well as all across the world. Only 5% of the milk produced in Ethiopia is sold in commercial markets. The Ethiopian Government has the view of strengthening competitiveness and

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promotions of enterprises remain cornerstones for the growth of the economy and the creation of decent work opportunities. This means that there will be a great opportunity to jump into commercial dairy farming and milk processing business. Hence, investing in dairy processing in Ethiopia is a profitable activity.

1.2. Brief description of product

Dairy products currently sold in the Ethiopian market can be categorized into milk products, such as raw, pasteurized, powder milk; butter products, such as fermented and pasteurized butter; and other products, such as cottage and other type of cheese, sour milk and yogurt. Among these products powder milk is not produced in Ethiopia at the moment, and are usually imported. Pasteurized (table/bread) butter, yogurt and various type of cheese (apart from cottage cheese) are both imported and locally produced.

Development of successful and sustainable dairy industry will be realized by strategic interventions of the investors in to all parts of possible entry points along the milk value chain especially on the innovation of new products. Accordingly, several entry points to produce new products can be considered as intervention opportunity in the dairy industry value chain with varied degree of resource requirement and level of competitions.

Detail Product Description

Milk: is a valuable nutritious food that has a short shelf-life and requires careful handling. Milk is highly perishable because it is an excellent medium for the growth of microorganisms. Particularly bacterial pathogens – that can cause spoilage and diseases in consumers. Milk processing allows the preservation of milk for days, weeks or months and helps to reduce food-borne illness. Pasteurization is a heat treatment process that extends the usable life of milk and reduces the numbers of possible pathogenic microorganisms to levels at which they do not

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represent a significant health hazard. Milk can be processed further to convert it into high-value, concentrated and easily transportable dairy products with long shelf-lives, such as butter, cheese and ghee.

1.3. Critical factors to Invest in the sectors

- Quite a lot of incentive and support are available from the government at all level to ease the entry of investors into the dairy industry.
- Due to the important nutritional value of milk, increasing consumption of milk either directly or through fortified foods is often a priority of national health and nutrition programs.
- Ethiopia's priority is to supply enough milk and dairy products for its population through own production
- with the objective of promoting commercial dairy production and the inflow of foreign capital and technology into the country, the Ethiopian government provides various packages of regulatory fiscal incentives to both foreign and domestic investors engaged in establishing new enterprises and expansions.
- The increase in urbanization, the population growth and increase in disposable income

1.4. Project location justification

1.4.1. Location of Addis Ababa

Addis Ababa is the seat of the Ethiopian federal government. It is located on the central highlands of Ethiopia in the middle of Oromia Region. The absolute location is around the

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intersection point of 9°1'48"N latitude and 38°44'24"E longitudes. This is very near to the geographical center of the country. It is, therefore, equidistant to the peripheral areas or is equally accessible to almost all parts of Ethiopia. Addis Ababa is located on a well-watered plateau surrounded by hills and mountains. The city is in the highlands on the edge of the Ethiopian rift valley or the eastern slopes of the Entoto Mountain ranges bordering the Great Rift Valley. The total area of Addis Ababa is about 540 km² of which 18.2 km² are rural. Addis Ababa's built-up urban area spans 474 km². It is also the largest city in the world located in a landlocked country.

1.4.2. Demography of Addis Ababa

According to the CSA (2013) population projection, Ethiopia's total population reaches about 105 million people in 2022. Of the total population 22.9% (24 million people) live in urban areas. Ethiopia's urban population is expected to triple by 2037 (World Bank, 2015). Addis Ababa hosts an estimated 3,859,638 people. Currently, Addis Ababa is experiencing an annual growth rate of 3.8% and is estimated to reach 4,696,629 inhabitants by 2032 (CSA, 2015).

1.4.3. Economic activity of Addis Ababa

The transformation of Addis Ababa has especially been rapid since 1991. According to the data from the city's Bureau of Finance and Economic Development (2006), per capital income of Addis Ababa has grown from USD 788.48 in 2010 to USD 1,359 in 2015. The city also achieved a decline in the poverty index from a high of 29.6 in 2012 to 22.0 in 2014. Moreover, the current poverty headcount index for Addis Ababa is estimated at 18.9 while the poverty severity account for 5 and 1.8 index points respectively. Even though, the poverty status of Addis Ababa has an improvement over previous years, there is still much work to be done to curb both the incidence

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and severity of poverty.

The major contributor to the economic growth of the city is the implementation of publicly financed mega urban projects like condominium housing, the Light Rail Transit, the international airport and industrial zone development (The state of Addis Ababa, 2017). The existence of international large and medium-size enterprises in and around Addis Ababa have also significant role in creating huge opportunity for employment and technology transfer. Furthermore, there are strong demand for goods and services following the existence of many embassies and inter-governmental organizations like the African Union, the United Nations Economic Commission for Africa.

The manufacturing sector's contribution to Addis Ababa's GDP is high. Despite the fact that 86% of the industries in the city are micro and small scale (cottage and handicrafts, and small-scale), the majority of the country's large and medium scale industries are found in the city. Noticeable increases are also registered currently in other aspects of industrial growth.

The service sector is both the largest contributor to the city's economy and the largest employer. It contributes to 76.4% of the city's GDP while industry's share makes up (almost all) the rest. This sector is dominated by three major sub-sectors: Transport and communication; Real estate, Renting and Business services; and Trade, Hotel and Restaurants. According to the state of Ethiopian Cities 2015 report, the service sector has also been responsible for more than 50% of the growth in the estimated annual growth of the city's GDP. Although 75% of employment in the city is also generated in the service sector, a large proportion of the employed work in low skill and low paying jobs as shop salespersons, petty and 'gullit' traders, sales workers in small shops, domestic helpers or doorkeepers and restaurant service workers.

Analysis of the economic structure of Addis Ababa reveals that the services sectors (63%)

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dominates with industry (36%) in second place indicating that these sectors account for almost all of the Addis Ababa's GDP (The State of Addis Ababa, 2017).

Addis Ababa has a great share in the economy of the country due to its attractiveness to businesses, companies, individuals and foreign direct investment. Overall primacy index of the city is 24.8 based on urban employment and unemployment survey (CSA 2015). According to the State of Addis Ababa 2017 report, the simultaneous high rates of economic growth and urbanization in Addis Ababa indicates a likely further rising dominance of the city in Ethiopia's economy as well as growing agglomeration of economic activities in and around the city.

1.5. Why is it beneficial to invest in Addis Ababa?

Addis Ababa is the largest and most economically significant city in the country. Ethiopia's urban population share is only 17 percent (as of 2012, World Bank 2015). The city is the only urban area in Ethiopia capable of delivering scale economies in terms of concentrated demand, specialization, diversity and depth of skills, innovation, and technology transfers. Thus, investors will be benefited in getting capable human power from the market.

The capital is the country's main industrial hub. The city dominates industrial capacity in almost all the branches of light manufacturing that Ethiopia prioritizes. As a result Addis Ababa completely dominates production in various subsectors. This can be taken as the political and social stability of the city.

Overall, the city has a beautiful environment, favorable location, and strong industrial base. Its advantage as an economic powerhouse of the country and human resource center are the most attractive features for local and overseas investors.

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Moreover, investors will be getting a comprehensive set of incentives for priority sectors. These include:

- Customs duty free privilege on capital goods and construction materials, and on spare parts whose value is not greater than 15% of the imported capital goods' total value.
- Investors have the right to redeem a refund of customs duty paid on inputs (raw materials and components) when buying capital goods or construction materials from local manufacturing industries.
- Income tax exemption of up to 6 years for manufacturing and agro-processing, and up to 9 years for agricultural investment.
- Additional 2-4 years income tax exemption for exporting investors located within industrial parks and 10-15 years exemption for industrial park developers.
- Loss Carry forward for half of the tax holiday period. Several export incentives, including Duty Draw-Back, Voucher, Bonded Factory, and Manufacturing Warehouse, and Export Credit Guarantee schemes.

1.5.1. The city benefit from the investment

The city will be benefited from investment. These are discussed below.

- Employment opportunity

Investment is expected to provide direct and indirect employment. These range from unskilled casual workers, semi-skilled and skilled employees.

- Improving growth of the economy

Through the use of locally available materials and exporting products, the investment contributes towards growth of the economy by contributing to the growth of domestic product. These eventually attract taxes including VAT which will be payable to the

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government hence increasing government revenue while the cost of local materials will be payable directly to the producers. In addition, domestic products save foreign exchange and exports also bring money to the country.

2. Marketing Study

2.1. Market analysis summary

The current drive and emphasis by the government on the diversification of the industrial base away from the other sector presents an opportunity for dairy farming to a valuable contribution towards achieving goal. Having undertaken a thorough and comprehensive research of the market we realized that there was a vast opportunity for domestic products. Aware of the fact operating in such a market is largely dependent on good networking, the promoter intends to establish networks and strategic relationships with various wholesalers and retailers to ensure a steady stream of orders. In so doing the owner intend to ensure that the products they produce are of extremely high quality and fully serve the customers purpose.

2.2. The Supply of processed milk products in Ethiopia

2.2.1. Local Processed milk and milk products Supply

In Ethiopia there are large scales, medium and small scale milk processing plant. The design capacity of the large and medium scale plants is estimated to be about 148,050 liters per day of different types of milk products (pasteurized milk, butter, cheese, and yogurt). The design capacity of these plants is shown below.

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Table 1 Some of milk processing plants and their capacities in Ethiopia

S/No	Factory	Daily processing capacity (in Liters)	Attained average Production Capacity in lit/day
1	Sebeta agro industry(mama Dairy)	35,000	30,000
2	Lame Dairy processing	60,000	30,000
3	Mb Plc (family milk)	15,000	7,000
4	Ada'a Dairy cooperative	15,000	3,000
5	Beria and family plc	9,000	6,000
6	Holland dairy	4,000	4,000
7	AlmiTikuWetet	4,000	4,000
8	Ruth and Hiruit Dairy farm	4,000	3,000
9	Abay fana Awash Agro industry	3,500	1,000
10	Chuye milk and milk products processing	3,000	2,000
11	Fantu and family dairy farm	2,500	1,000
12	Zemen milk	2,000	2,000
13	Penguin international business plc	1,800	150
14	Life milk processing enterprise	1,500	600
15	Semit agro industry/Enat milk	4,000	1,500
16	Beral milk	5,000	300
17	Harmonise agro industry	5,000	1,000
18	Jantekel Dairy union	1,200	500
19	Mdjo Dairy	4,000	1,000
20	Some others		50,000
	Total		148,050

Source: FAO and consultant survey

2.2.2. Import

The supplies of pasteurized Milk, cheese, yogurt and butter have been met both through import and domestic production. Although there is no apparent trend in the growth of import pasteurized Milk, cheese, yogurt and butter have continuously been appearing in the import statistics.

2.2.3. Imported processed Milk (Pasteurized Milk, cheese, yogurt and butter)

As it has been shown in table 2 import of pasteurized Milk which was 1,553,132 kg at the beginning of the period (2012) has grown to 9,544,489kg by the end of December, 2021. A closer observation at the data set reveals that imported pasteurized Milk over the study period has shown varying patterns that is, fluctuation from 2012 to 2021.

As it has been shown in table 3 import of cheese which was 97,567 kg at the beginning of the period (2012) has grown to 120,028 kg by the end of December, 2021. A closer observation at the data set reveals that imported cheese over the study period has shown varying patterns that is, fluctuation from 2012 to 2021.

As it has been shown in table 4 import of yogurt which was 33,047 kg at the beginning of the period (2012) has grown to 39,925 kg by the end of December, 2021. A closer observation at the data set reveals that imported yogurt over the study period has shown varying patterns that is, fluctuation from 2012 to 2021

As it has been shown in table 5 import of butter which was 11,110 kg at the beginning of the period (2012) has decreased to 2,003kg by the end of December, 2021 A closer observation at the data set reveals that imported butter over the study period has shown varying patterns.

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Table 2 Volume of imported pasteurized milk from 2012 to 2021 in kg

Year	Item Description	Gross Wt(kg)	Net Wt (Kg)	CIF Value IN (ETB)	CIF Value in (USD)	Total Tax in (ETB)
2012	MILK	1,865,665.67	1,553,131.78	156,135,007.11	8,739,421.40	55,822,316.63
2013	MILK	1,194,441	1,013,759	78,893,310	4,196,430	28,495,011
2014	MILK	1,468,887	1,267,792	114,986,489	5,708,339	37,695,985
2015	MILK	1276136.74	1070081.54	120031057.5	5775722.14	42573018.8
2016	MILK	570404.33	472610.39	58891971.85	2726669.53	20332267.18
2017	MILK	2,376,180.72	2,182,731.28	242,285,966.94	10,004,829.98	65,106,541.00
2018	MILK	1,142,205.84	978,779.60	149,350,447.60	0.00	48,170,394.17
2019	MILK	0.00	0.00	0.00	0.00	0.00
2020	MILK	3,108,026.29	2,623,603.57	654,543,298.00	0.00	85,586,085.13
2021	MILK	10,249,314.10	9,544,488.62	1,470,796,190.00	0.00	96,684,373.24
	Average	2,595,929	2,303,148	339,256,642	4,182,428	54,513,431

Sources: Ethiopian Revenue and customs Authority

Table 3 Volume of imported cheese from 2012 to 2021 in kg

Year	Item Description	Gross Wt.(kg)	Net Wt. (Kg)	CIF Value IN (ETB)	CIF Value in (USD)	Total Tax in (ETB)
2012	Cheese	102,727	97,567	8,884,511	497,297	5,949,324
2013	Cheese	85548	83532	12508642	665349	8421564
2014	Cheese	177363.93	175049.24	22202656.	1102219	7677205.84
2015	Cheese	171759.55	157121.82	19289550	928185	12758194.74
2016	Cheese	120728.77	109086.86	14540164	673202	9388119.37
2017	Cheese	187248.24	168380.85	22721204	938237	15047829.29
2018	Cheese	80,950.87	78,627.49	13,733,326.77	0.00	8,845,145.48
2019	Cheese	0.00	0.00	0.00	0.00	0.00
2020	Cheese	109,487.19	100,356.64	14,528,230.00	0.00	9,472,542.26
2021	Cheese	135,741.74	120,028	22,997,588	0.00	15,260,324
	Average	129,812	120,723	16,748,260	529,980	10,263,033

Sources: Ethiopian Revenue and customs Authority

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Table 4 Volume of imported yogurt from 2012 to 2021 in kg

Year	Item Description	Gross Wt(kg)	Net Wt (Kg)	CIF Value IN (ETB)	CIF Value in (USD)	Total Tax in (ETB)
2012	Yogurt	36,194.58	33,047.13	2,580,800.26	144,456.40	1,740,749.28
2013	Yogurt	12209.5	11488.5	1082221.16	57564.64912	729957.91
2014	Yogurt	52266.31	51950.31	2905118.79	144220.4368	1334193.89
2015	Yogurt	38887.85	36546.07	2114937.45	101767.7533	1426524.95
2016	Yogurt	25890.02	25890.02	1257795.23	58235.30477	793391.72
2017	Yogurt	38049.95	35819.12	2537285.6	104773.3481	1711398.88
2018	Yogurt	19,240.30	19,240.30	841,215.09	0.00	567,375.27
2019	Yogurt	0.00	0.00	0.00	0.00	0.00
2020	Yogurt	87,898	85,926	3,872,469	110,800	2,613,979
2021	Yogurt	41,625	39,926	3,457,833	78,019	2,426,345
	Average	39,140	37,759	2,294,408	88,871	1,482,657

Sources: Ethiopian Revenue and customs Authority

Table 5 Volume of imported butter from 2012 to 2021 in kg

Year	Item Description	Gross Wt(kg)	Net Wt (Kg)	CIF Value IN (ETB)	CIF Value in (USD)	Total Tax in (ETB)
2012	butter	11,451.07	11,109.96	905,657.64	50,692.82	609,506.86
2013	butter	8358	8289	646256.56	34375.16609	435899.72
2014	butter	38939.35	38809.29	5408423.31	268493.383	725303.42
2015	butter	32172.07	30329.3	2779873.27	133763.5102	1875024.03
2016	butter	13851.35	13801.35	1205088.87	55795.02604	635590.62
2017	butter	14081.44	13741.09	2272018.5	93819.54338	1532476.16
2018	butter	1,892	1,892	171,890		115,902
2019	butter	-	0.0	-		-
2020	butter	3,930	3,647	488,021	13,963	329,382
2021	butter	2,218	2,003	292,109	6,591	206,476
	Average	18,009	16,898	564,579	23,429	362,131

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2.2.3.1. Forecast of future import of Dairy products

Table 6 Future forecast of import of dairy products by trend adjusted exponential smoothing method

Year	Projected local supply	Forecasted import			
		Pasteurized milk	Cheese	Yogurt	Butter
2022	54,038,250	9,544,489	120,028	39,926	3,103
2023	55,389,206	10,343,624	122,274	40,614	3,103
2024	56,773,936	11,142,760	124,520	41,302	3,103
2025	58,193,285	11,941,896	126,766	41,990	3,103
2026	59,648,117	12,741,031	129,012	42,678	3,103
2027	61,139,320	13,540,167	131,259	43,365	3,103
2028	62,667,803	14,339,303	133,505	44,053	3,103
2029	64,234,498	15,138,438	135,751	44,741	3,103
2030	65,840,360	15,937,574	137,997	45,429	3,103
2031	67,486,369	16,736,710	140,243	46,117	3,103
2032	69,173,529	17,535,845	142,489	46,805	3,103

Compiled by: - Consultant

2.3. Processed milk products Demand Projection

The demand for processed milk products can be influenced by a number of factors. The size of population and its growth rate, disposable income and prices are few among many variables. However, data on some of these parameters are not readily available in Ethiopia. Consequently, it is difficult if not possible to objectively quantify the actual demand. Nevertheless, for the purpose of this study, attempts have been made to forecast the likely future demand for Processed milk products on the basis of the following assumptions:

- i. Ethiopia population is estimated to be 120,202,679. As of today
- ii. Annual growth of population is taken to be 2.5%
- iii. Preference by the processors to buy intermediary products instead of in-house manufacturing.
- iv. Expansion of fast food industry in the country
- v. Increasing portion of office working women
- vi. The existing processors foresee no change in supply

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2.4. Potential demand

Ethiopia has one of the lowest levels of per capital dairy consumption in the world. FAO and other studies invariably revealed that the per capital milk and milk products consumption in Ethiopia is about 19 kg, which is close to that for Africa of about 25kg and is much lower than that recommended by world health organization (WHO) of 200kg and 175 kg of FAO as the minimum level for a balanced diet. This depicts that the market for milk is positive owing to inadequate supply of milk.

Table 7 Potential demand of milk products in kg

Year	Number of population	Potential Demand of milk products in kg	Local supply of processed milk products	GAP b/n potential demand and local supply
2022	120,202,679	2,283,850,901	54,038,250	2,229,812,651
2023	123,207,746	2,340,947,174	55,389,206	2,285,557,968
2024	126,287,940	2,399,470,853	56,773,936	2,342,696,917
2025	129,445,138	2,459,457,624	58,193,285	2,401,264,339
2026	132,681,267	2,520,944,065	59,648,117	2,461,295,948
2027	135,998,298	2,583,967,666	61,139,320	2,522,828,346
2028	139,398,256	2,648,566,858	62,667,803	2,585,899,055
2029	142,883,212	2,714,781,030	64,234,498	2,650,546,532
2030	146,455,292	2,782,650,555	65,840,360	2,716,810,195
2031	150,116,675	2,852,216,819	67,486,369	2,784,730,450
2032	153,869,592	2,923,522,240	69,173,529	2,854,348,711

As it is indicated above the potential demand for processed milk products at 2022 is 2.2 billion kg. This volume will increase to 2.85billion kg in the year 2032.

3. Engineering and technology

3.1. Engineering

3.1.1. Land, buildings and civil works

The required area (m²) and construction cost for the production facilities essential for the successful operation of the processing plant is shown below.

A total area ready for the processing plant is about 10,000m² out of which 5,130 m² is to be covered by building while uncovered area of 4,870 m² is left open for parking, septic tank. In order to estimate the land lease cost of the project profiles it is assumed that all the project will be located in different land level from level 1/1 to level 4/3, their current market lease price is from 39,073.31 birr per M² to 2,800.71 birr per M² respectively. Therefore, for the profile a land lease rate of birr 3,885 per M² have been taken, which is between the ranges.

The cost of construction of building should be appropriate to the size and expected profitability of business, costs of building generally differs by the type of construction materials used, the type of foundation, wall height and location. The total construction cost of buildings and civil works, at a rate of Birr 20,000 per m² is estimated at Birr 105.60million.

3.1.2. Plant layout

Plant layout is the plan of optimum arrangement of an industrial facility. It embraces the physical arrangement of various departments, machines, equipment and services for economical, efficient and effective functioning while planning the production of any goods. The agro processing plant layout has been developed taking into consideration international and national code of hygienic practices.

PROJECT PROFILE ON DAIRY FARMING

Table 8 Estimated construction costs

S/No	Descriptions	Total area in M ²	Estimated cost per square meter	Total estimated cost
			(in Birr)	(in Birr)
1	Animal feed store	1,000	20,000.00	20,000,000.00
2	Shade	2,500	20,000.00	50,000,000.00
3	Laboratory room	50	20,000.00	1,000,000.00
4	Milk store room	1,000	20,000.00	20,000,000.00
14	Power station room	20	20,000.00	400,000.00
16	Administration office	100	20,000.00	2,000,000.00
18	Toilet and shower for female	40	20,000.00	800,000.00
19	Room for cloth changing for female	40	20,000.00	800,000.00
20	Toilet and shower for male	40	20,000.00	800,000.00
21	Room for cloth changing for male	40	20,000.00	800,000.00
22	Parking	300	20,000.00	6,000,000.00
25	For expansion	4,870	0.00	0.00
26	Fence	0	Lump sum	3,000,000.00
	GRAND TOTAL	10,000		105,600,000.00

PROJECT PROFILE ON DAIRY FARMING

Table 9 Land lease period in Addis Abeba

Sector of development activity	Period of lease	Down payment
Education, health, culture and sports	90	10%
Industry (manufacturing)	70	10%
commerce	60	10%
For urban agriculture	15	10%
For others	60	10%

Sources: - city government of Addis Abeba land development and management bureau

Table 10 Land lease floor price in Addis Abeba

S/No	Land level	Current land lease floor price per M ²	Current lease price per M ² (Market price)
1	1/1	2,213.25	39,073.31
2	1/2	2,165.47	36,825.73
3	1/3	1,900.19	34,578.15
4	¼	1,552.93	31,119.21
5	1/5	1,531.91	29,096.45
6	2/1	1327.39	27,073.71
7	2/2	1,221.18	25,050.96
8	2/3	1,191.17	23,028.21
9	2/4	1,074.39	21,005.46
10	2/5	1,027.84	18,982.71
11	3/1	994.71	16,959.96
12	3/2	960.21	14,937.21
13	3/3	927.84	12,914.46
14	¾	904.77	10,891.71
15	3/5	873.74	8,868.96
16	4/1	814.06	6,846.21
17	4/2	786.45	4,823.46
18	4/3	748.80	2,800.71

Sources: - city government of Addis Abeba land development and management bureau

PROJECT PROFILE ON DAIRY FARMING

3.2. Technology

3.2.1. Assumptions

- The project life is ten years
- Male calves will be disposed of between zero and one month after birth
- Both male and female calves consume 3liters/head/day for 15 days. Then all male calves will be culled while female calves continue to consume 3 liters for 90 days
- 90% of the cows/heifers expected to be pregnant
- Calving interval = 1 year
- Calf mortality = 5%
- Death rate of cow = 2%
- Starting from fourth years 50% of new cow will be sold to Nearby community and dairy farm and other 50% used in farm.
- Only two male calves maintain in farm each year other will be sold
- Medication and veterinary is assumed to cost Birr 200 /head/annum

PROJECT PROFILE ON DAIRY FARMING

Table 11 Dairy herd size projection

Dairy Herd Size Projection													
No	Description	Rate (%)	Project Years										
			0	1	2	3	4	5	6	7	8	9	10
1	Cows		-	300	300	300	355	420	495	584	689	812	958
	Milking cows available at hand		-	300	300	300	355	420	495	584	689	812	958
	Purchase		300	-	-	-	-	-	-	-	-	-	-
	Death	2%		6	6	6	7	8	10	11	14	16	19
	Culls	3%		9	9	9	10	12	14	17	21	24	27
	Closing Numbers			285	285	285	338	400	471	556	654	771	910
2	FEMALE CALF												
	Available at Hand												
	BIRTH	45%		128	128	128	152	180	212	250	294	347	409
	DEATH	5%		6	6	6	7	9	10	12	15	17	20
	Closing Numbers			122	122	122	145	171	202	238	279	330	389
3	Heifers 1 - 2 Years												
	Heifers available at hand			122	122	122	145	171	202	238	279	330	389
	Death	3%		3	3	3	4	5	6	7	8	10	12
	Culls	3%		3	3	3	4	5	6	7	8	10	12
	Closing Numbers			116	116	116	137	161	190	224	263	310	365
4	Heifers 2- 3 Years												
	Heifers available at hand			116	116	116	137	161	190	224	263	310	365
	Death	3%		3	3	3	4	5	6	7	8	9	10
	Culls	3%		3	3	3	4	5	6	7	8	9	10
	SALE			55	55	55	65	75	89	105	123	146	172
	Closing Numbers			55	55	55	65	75	89	105	123	146	172
5	Male Calves												
	BIRTH	45%		128	128	128	152	180	212	250	294	347	409
	DEATH	5%		6	6	6	7	9	10	12	15	17	20
	SALE			120	120	120	143	169	200	236	277	328	387
	Closing Numbers			2	2	2	2	2	2	2	2	2	2
	Total closing Herd size			580	580	580	687	809	954	1125	1321	1559	1838

PROJECT PROFILE ON DAIRY FARMING

3.2.2. Plant capacity

Processing raw milk produces a number of products such as, pasteurized milk, yoghurt, cheese and butter, and investment could be on pasteurizing plants with a capacity of processing 10,000 liters' per day and we assume 365 working days per year. The processing plant will start production at 70% of 10,000 lit/day, which will grow to 80% in the second year and 90% capacity will be attained in the third year. Full capacity production will be attained in the fourth year and onwards.

3.2.3. Production program

Table 12 production program

Dairy Herd Size Projection													
No	Description	Rate (%)	Project Years										
			0	1	2	3	4	5	6	7	8	9	10
1	Cows		-	300	300	300	355	420	495	584	689	812	958
	Closing Numbers			285	285	285	338	400	471	556	654	771	910
2	FEMALE CALF												
	Closing Numbers			122	122	122	145	171	202	238	279	330	389
3	Heifers 1 - 2 Years												
	Closing Numbers			116	116	116	137	161	190	224	263	310	365
4	Heifers 2- 3 Years												
	SALE			55	55	55	65	75	89	105	123	146	172
	Closing Numbers			55	55	55	65	75	89	105	123	146	172
5	Male Calves												
	SALE			120	120	120	143	169	200	236	277	328	387
	Closing Numbers			2	2	2	2	2	2	2	2	2	2
	Total closing Herd size			580	580	580	687	809	954	1125	1321	1559	1838

3.2.4. Environmental and social impact assessment of the project

Typically, any developmental projects also trigger a set of environmental and social impacts. These environmental and social due to development projects occur in different forms. An Environmental and Social Impact Assessment (ESIA) has to be carried out to study the potential environmental and social impacts due to dairy farming. Potential environmental and social impacts due to the production of dairy farming products on attributes like air quality, noise, water quality, soil, flora, socio-economic, etc. have to be assessed as part of the ESIA study. Appropriate mitigation measures to help minimize/avoid impacts from the development have to be recommended in the study. The measures include avoidance measures, mitigation measures and environmental enhancement measures. For the purpose of including environmental costs, the costs of wastewater treatment plant and solid waste incineration systems are included in the cost of machinery and equipment. Social responsibility cost estimated to be 1% of fixed investment costs.

PROJECT PROFILE ON DAIRY FARMING

4. Organizational structure for milk processing plant

The selection of structure of the envisaged project is made based on the existing structure of dairy farming business operating in the country, the capacity, complexity and technology mix of the plant. Organizational structure principles such as specialization, coordination, and departmentalization are also considered for design of structure that best suits the envisaged project

4.1. Manpower Requirement and Estimated Annual Labor costs

Table 13 Manpower requirement and salary costs

Description	Number	Monthly salary	Annual salary, Birr
General manager	1	30,000.00	360,000.00
Administration and finance manager	1	20,000.00	240,000.00
Human resource manager	1	15,000.00	180,000.00
Secretary	1	7,500.00	90,000.00
Marketing and sales officer	1	10,000.00	120,000.00
Sales manager	1	20,000.00	240,000.00
Accountant	1	10,000.00	120,000.00
Veterinary doctor	1	20,000.00	240,000.00
Mechanic	1	10,000.00	120,000.00
Electrician	1	10,000.00	120,000.00
Purchaser	1	10,000.00	120,000.00
Operator	3	5,000.00	180,000.00
Ass. Operator	3	3,000.00	108,000.00
Laboratory technician	1	7,500.00	90,000.00
Guard	4	4,000.00	192,000.00
Driver	1	10,000.00	120,000.00
Cleaners	12	3,000.00	432,000.00
Total	35		3,072,000.00

PROJECT PROFILE ON DAIRY FARMING

5. Financial Analysis

5.1. General

The financial analysis evaluation of Dairy farming project, are mainly consisted of capital investment as well as operating and maintenance costs. The capital investment costs include fixed investment costs (initial fixed investment and replacement costs) and working capital, while operating and maintenance costs comprise current expenses related to material inputs, manpower cost, utility, repair and maintenance costs, spare parts, Overheads, Sales and distribution, interest and depreciation expenses.

The financial analysis and evaluation has been conducted taking assumptions:

1. It is assumed that about 70% of the total capital investment costs including the working capital requirement could be covered through development bank loans of short and long-term credits. The remaining balance 30% will be covered by equity capital contribution of the project owner.
2. Even though the project might secure loans under different term and conditions as well as from different financial sources, for the purpose of calculation of debt service scheduling, the current development bank of Ethiopia credit terms and conditions have been used. Consequently. It is assumed that the project will secure loan facility on the basis of 11.5 % annual interest rate.
3. Even though the estimated project production life is more 10 years, the financial analysis has been undertaken for a period interval covering the first 10 years only, during which time most of the capital assets are assumed to be depreciated, debts recovered and pay-back period accomplished.

PROJECT PROFILE ON DAIRY FARMING

4. It is assumed that the project will be start up production activity at 70 % capacity. During years 2 & year 3 the projects is anticipated to gradually increase capacity utilization to reach 100% in year 4. Therefore, starting from year 4 the project will be operational at full capacity.
5. For the project under reference promotional, sales and distribution expenses have been estimated at 3% of the sales revenue.
6. Maintenance and spare parts costs are 1.5% of the fixed investment costs.
7. Furniture and fixture costs assumed to be 500,000.00

5.2.Fixed capital investment costs

Table 14 Fixed capital investment costs

S/No	Fixed investment type	Unit of measurement	Quantity	Unit price	Total Amount	Remarks
1	Land	Square meter	10,000	3,885 birr/M ²	38,850,000.00	The period of land lease will be 70 years and 10% of the total lease amount will be paid in the first year
2	Buildings and civil works	Square meter	5,130	lump sum	105,600,000.00	
	Sub total				144,450,000.00	
3	Machineries	set	2	Lump sum	12,000,000.00	
4	Transformer	set	1	Lump sum	2,000,000.00	
5	Weighbridge	Set	1	Lump sum	4,000,000.00	
6	Truck and vehicles	Pcs	2	Lump sum	6,000,000.00	
7	Furniture and fixture	Pcs			500,000.00	
	SUB TOTAL				24,500,000.00	
	Fixed capital investment costs				168,950,000.00	
8	pre-operational expenses				2,000,000.00	
	Working capital				7,674,000.00	
	TOTAL INVESTMENT COSTS				178,624,000.00	

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5.2.1. Machineries costs

Table 15 Lists of machineries costs

S/No	Description of expenditure	Quantity	Unit price (ETB)	Total amount (ETB)
1	Milk reception <ul style="list-style-type: none"> ✓ Milk testing unit ✓ Weighing scale ✓ Dump tank ✓ Centrifugal pump (2) ✓ Plate cooler ✓ Milk cooling tank ✓ Controlling 	1 set	5,000,000	5,000,000.00
2	Cow milking machine	300	25,000	7,500,000.00
TOTAL IN ETHIOPIAN BIRR				12,000,000.00 ETB

5.2.1.1. Lists of machinery suppliers

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5.3. Working capital

Working capital is the financial means required for smooth operation and maintenance of a project mathematically, it is a difference between current assets and current liabilities. In the particular case of the project under consideration, the current assets comprise receivables, inventories (local and imported material inputs, spare parts, work in progress, and products ready for delivery) and cash in hand, while current liabilities comprise accounts payable to creditors, and are free of interest payment. Calculation of working capital and its assumption see in the annex below.

5.4. Project Financing

Fixed capital investment costs, pre-operation capital expenditures and working capital requirements are assumed to be financed by equity capital of the project promoter and through loans of short and long-term credits.

As stated earlier even through the project might obtain loans under different terms are condition as well as from different sources, for the purpose of calculation of debt service scheduling the current Development bank of Ethiopia credit terms and conditions have been used. Accordingly, it is assumed that the project will be able to obtain about 70% of the total investment costs through bank loans that will have to be repaid back within 10 years, during which time interest will be paid on the loan. The remaining balance, 30% of the total investment costs are expected to be covered by equity contribution of the project promoter.

PROJECT PROFILE ON DAIRY FARMING

5.5. Production costs

As it is depicted in Table 21 major categories of the total production costs are assembled into the following cost elements.

5.5.1. Material inputs

In the project under study the basic material inputs are animal feed, medication and etc. Therefore, the current prevailing local and international market prices have been used for estimation of material inputs costs. At full capacity operation the material inputs costs are estimated at Birr 35 million per annum. Because of the specific nature of the given project which is based predominantly on local raw material utilization almost 100 % of the material inputs are attributed to purchase of raw materials.

5.5.2. Utilities

In estimating costs of utility expenses for operation and maintenance of the project, Costs of fuel, oil and lubricant, electricity and water consumptions have been taken in to consideration, the rates of which have been estimated on the basis of the proposed capacity utilization program of the project and at the current official charging rates. At full capacity operation the project will have the following utility expense per annum which amounts to Birr 2.50 million.

PROJECT PROFILE ON DAIRY FARMING

Table 16 Utilities of the project

S/No	Utilities “000” Birr		Year 1	Year 2	Year 3	Year 4
1	Fuel					
	1.1. Gasoline for Isuzu’	(200km*365days*37 Birr/lit*5km/lit)	540	540	540	540
	1.2. Gasoline for transport truck (FSR)	200km*365days*37Birr/lit*3km/lit	900	900	900	900
	Sub total		1,440	1,440	1,440	1,440
	1.4. Change of oil and lubricant	10 % of fuel consumption	144	144	144	144
	Sub total		1,584	1,584	1,584	1,584
2	Electricity	365 days*16hrs*150kw*0.69Birr/kwh	423	483	544	604
3	Water	365 days*50 m ³ /day*15 Birr/m ³	192	219	246	274
4	Telephone	3 lines *500 Birr/month/line+8 Birr /line/month	18.28	18.28	18.28	18.28
5	Fax	1 line *500 Birr/month + 17 Birr/line/month	6.2	6.2	6.2	6.2
6	Internet	5,000 Birr/month	5.0	5.0	5.0	5.0
	Sub total		644.48	731.48	819.48	907.48
	TOTAL		2,228	2,315	2,403	2,491

5.5.3. Over heads

In the expenses under this title have been included land and building taxes, buildings, vehicles as well as machinery and equipment insurance, vehicles annual inspection; postage, telephone and e. mail, stationery and office supplies; printing and copying; audit fee; cash indemnity etc. The overhead costs and divided in to direct overheads and administration overheads.

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Table 17 Overhead costs

S/No	Overhead costs		Year 1	Year 2	Year 3	Year 4
	Direct overhead “000) Birr					
	Annual land lease payment	10,000 square meters	5,550	5,550	5,550	5,550
	Insurance					
	• Building and civil works	0.1%	106.00	106.00	106.00	106.00
	• Machinery and equipment	0.2 %	48.00	48.00	48.00	48.00
	• Vehicle and truck	2 %	120.00	120.00	120.00	120.00
	• Vehicles annual inspection and registration	20,000 Birr per annum per vehicle	40.00	40.00	40.00	40.00
	Work cloth	Two times per annum per workers at 1,000 Birr	70.00	70.00	70.00	70.00
	Cleaning and sanitation	An estimate of 100 Birr/day	36.50	36.50	36.50	36.50
	SUB TOTAL		5,971	5,971	5,971	5,971
	Administration overhead					
	Audit fee	40,000 Birr per annum	40.00	40.00	40.00	40.00
	Stationery and office supplies	2,000 per month	24.00	24.00	24.00	24.00
	Printing and copying	2,000 per month	24.00	24.00	24.00	24.00
	Cash indemnity	20,000 per annum	20.00	20.00	20.00	20.00
	SUB TOTAL		108.00	108.00	108.00	108.00
	TOTAL		6,079	6,079	6,079	6,079

5.5.4. Financial costs

As it has been outlined earlier under” project Financing” the current development Bank of Ethiopia credit terms and conditions for newly establishing projects have been used to compute the financial costs, estimated to be incurred in connection with that portion of the total investment costs assumed to be covered through loan financing. The amount of the loan capital to be obtained and the financial costs to be incurred thereof have been determined depending on

PROJECT PROFILE ON DAIRY FARMING

the fixed capital and the working capital requirements and the project implementation schedule.

5.5.5. Depreciation

Depreciation charges should be taken in to account as part of the total production costs in order to calculate the total production costs, the net working capital and the gross or net-profit. For the given project under reference, the fixed assets and the pre-production capital expenditures have been depreciated and amortized respectively on “a straight line” depreciation method basis using the following rates of the original acquisition costs of the assets:

The rationale uses for the estimation of the depreciation and the amortization rates is based on the expected service life of the assets and repayment capacity of the project under consideration. Based on the above charging rates and consideration of the above facts, the total annual depreciation cost at full capacity operation have been estimated at Birr 11.20 million.

Table 18 Depreciation costs

Period			Start-up			
			70 %	80 %	90 %	100 %
Capacity utilization			1	2	3	4
Project year						
Item description	Original Value					
Structure and civil works	105,600,000.00	5% of original value	5,280	5,280	5,280	5,280
Machinery and equipment	24,000,000.00	15 % of original value	3,600	3,600	3,600	3,600
Transformer	2,000,000.00	15 % of original value	300	300	300	300
Motor vehicles and trucks	6,000,000.00	15% of original value	900	900	900	900
Weighbridge	4,000,000.00	15 % of original value	600	600	600	600
Office equipment and furniture	500,000.00	20 % of original value	100	100	100	100
Pre-production expenses	2,000,000.00	25% of original value	500	500	500	500
Total			11,280	11,280	11,280	11,280

PROJECT PROFILE ON DAIRY FARMING

5.6. Project costs

Project capital investment costs are the sum of fixed capital investment (fixed investment plus pre-production capital expenses) and net working capital at full capacity, with fixed capital constituting the resources required for land acquisition, construction of structures and civil works, purchase, import and installation of production machinery and equipment and general service facilities, whereas the working capital corresponding to the resources needed for operation of the project totally or partially.

In the assumptions used to compute the working capital, basically care has been taken to cover of consumable materials inventory (material inputs, spare parts stock, work-in progress and products ready for delivery) delivered products.

5.7. Break Even point (BEP)

A. Break-even point(BEP) Sales

To determine BEP Annual Sales, multiply annual sales found in income statement by the annual fixed cost, and divided by Annual sales less Annual variable cost.

$$\text{BEP (sales)} = \frac{\text{Annual sales} \times \text{Annual fixed costs}}{\text{Annual sales} - \text{Annual variables costs}}$$

Annual sales = 113,715,000 Birr

Unit selling price = 11,682 Birr(average)

$$\text{BEP (sales)} = \frac{\text{Annual sales} \times \text{Annual fixed costs}}{\text{Annual sales} - \text{Annual variables costs}} = 41,315,578.00 \text{ birr}$$

$$\begin{aligned} \text{BEP percentage} &= \frac{\text{Annual fixed costs} \times 100\%}{\text{Annual sales} - \text{Annual variables costs}} \\ &= 36.33\% \end{aligned}$$

PROJECT PROFILE ON DAIRY FARMING

5.8. Return on investment

$$\begin{aligned}\text{Return on investment} &= \frac{\text{Net profit}}{\text{total capital requirement}} \\ &= 95,193,000/125,036,800 \\ &= 76\%\end{aligned}$$

The return on owners' investment (ROOI)

$$\begin{aligned}&= \frac{\text{Annual Net Profit}}{\text{Owners' investment}} \\ &= 95,193,000/53,587,200 \\ &= 178\%\end{aligned}$$

5.9. Project benefits

For financial analysis and evaluation of the given project the current raw materials buying price and raw milk selling price at the project gate has been taken as a basis. Consequently, based on the recent market survey, raw materials buying price per kg at the nearby market points is shown in Table 20 and delivery price of the milk products per liters or kg at the project gate is also shown in Table 23. As it has been stated earlier the project is envisaged to reach full capacity operation four years after commencement of production activities which are assumed to begin with 70% of the estimated total capacity.

For financial analysis and evaluation of the given project, the current raw milk price at the project gate has been taken as a basis. Consequently, based on the recent market survey, raw milk price delivery price per liters at the nearby market pints is estimated at Birr 70. As it has been stated earlier the project is envisaged to reach full capacity operation four years after

PROJECT PROFILE ON DAIRY FARMING

commencement of production activities which are assumed to begin with 70% of the estimated total capacity.

Thus, according to the computation in Annex Table 25 and Annex Table 27, the net income and cash flow statements analysis revealed that at full capacity operation the project will generate a total income (gross revenue) amounting to 191 million Birr per annum. The corresponding Annex Table 25 of “Net Income Statement” shows a steady growth of gross profit starting from 59 million Birr in year 1 reaching the peak of 440 million Birr in year 10. In its 10 years of manufacturing activities, the project is expected to generate a total net profit of 1.33 billion Birr and contribute 719 million Birr to the government treasury in form of 35% income tax.

According to the current investment Law, machinery and equipment are anticipated to be imported duty- free. The liquidity position of the project is very strong. The corresponding Annex Table 27 of “Cash Flow Statement” shows the positive cumulative cash balance of Birr 1.3 billion and the project will not face any cash shortage throughout its production life.

The computation of the pay-back period as depicted in Annex table 32 indicates that the project will be able to reimburse itself from its net cash-income within 4 years after commencement of production activities, the period which is considered to be very good for the project of this nature. In Annex Table 33 of the Net present value (NPV) have been calculated at 17% discount factor (D.F) for 10 years of the project activity. Accordingly, the project has NPV of 646 million Birr and benefit cost ratio is 2.98 at 17%D.F. These results are most appreciable, especially, when related to the external capital borrowing interest rate which ranges from 8.50% to 18.50 % for newly establishing projects. The project under study when implemented will have BEP at about 36% operation of the estimated full capacity. In addition to this, finally, summary of

PROJECT PROFILE ON DAIRY FARMING

financial efficiency tests have been conducted in Annex table 28, Accordingly, all efficiency ratios indicated positive trends and consequently, it can be inferred that the project can operate in the frame work of free market mechanism on commercially and financially viable basis and is remunerative.

ANNEX

Table 19 Materials input in quantity

Year	Unit	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Animal feed											
➤ Concentrate	kg	364,088	364,088	364,088	453,513	536,550	632,363	746,060	880,198	1,037,330	1,223,845
➤ Hay mixture	Quintals	109,500	109,500	109,500	129,575	153,300	180,675	213,160	251,485	296,380	349,670
Medication	Lump sum 500 birr/cow	150,000	150,000	150,000	177,500	210,000	247,500	292,000	344,500	406,000	479,000

Table 20 Materials input in Birr''000''

Year	Unit price	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Animal feed											
➤ Concentrate	35	12,743	12,743	12,743	15,873	18,779	22,133	26,112	30,807	36,307	42,835
➤ Hay mixture	15	1,643	1,643	1,643	1,944	2,300	2,710	3,197	3,772	4,446	5,245
Medication	Lump sum	150	150	150	178	210	248	292	345	406	479
Total		14,536	14,536	14,536	17,995	21,289	25,091	29,601	34,924	41,159	48,559

PROJECT PROFILE ON DAIRY FARMING

CALCULATION OF ANNUAL PRODUCTION COSTS

Table 21 Annual total production costs

Project Year	1	2	3	4	5	6	7	8	9	10
Cost category										
I. Material inputs	14,536	14,536	14,536	17,995	21,289	25,091	29,601	34,924	41,159	48,559
II. Labor	3,072	3,072	3,072	3,072	3,072	3,072	3,072	3,072	3,072	3,072
III. Utility	2,228	2,315	2,403	2,491	2,491	2,491	2,491	2,491	2,491	2,491
IV. Repair and Maintenance and spare parts (1.5 % of fixed costs)	1,952	1,952	1,952	1,952	1,952	1,952	1,952	1,952	1,952	1,952
VI Direct overheads	5,971	5,971	5,971	5,971	5,971	5,971	5,971	5,971	5,971	5,971
A. Direct Production costs	27,759	27,846	27,934	31,481	34,775	38,577	43,087	48,410	54,645	62,045
VII. Administration over head	108	108	108	108	108	108	108	108	108	108
VIII. Marketing and Promotional expense 1 % of sales revenue	1,137	853	1,293	1,912	2,261	2,664	3,149	3,703	4,368	5,155
B. Operating costs	29,004	28,807	29,335	33,501	37,144	41,349	46,344	52,221	59,121	67,308
Interest	14,379	13,539	12,603	11,560	10,396	9,099	7,652	6,039	4,241	2,235
Depreciation	11,280	11,280	11,280	11,280	10,780	10,680	8,882	5,280	5,280	5,280
C. Total production costs	54,663	53,626	53,218	44,793	58,320	61,128	62,878	63,540	68,642	74,823

PROJECT PROFILE ON DAIRY FARMING

ANNEX I

CALCULATION OF WORKING CAPITAL REQUIREMENTS

I. Minimum requirement of current assets and liabilities

- A. Accounts receivable: value of goods distributed but not yet paid for, value of 30 days finished goods
- B. Inventory
 - 1. Material inputs : 90days
 - 2. Spare parts, maintenance and repair : 90 days
 - 3. Work under process : one day at direct costs
 - 4. Product ready for delivery : 1 day at direct costs plus administration overheads
- C. Cash on hand : 90 days
- D. Accounts payable 30 days for material inputs and utilities

ii. Working capital requirement

Table 22 Calculation of working capital

Cost category	Minimum Days of coverage	Coeff-icient of turnover	Project year									
			Start up			Full capacity						
			1	2	3	4	5	6	7	8	9	10
I. Current asset												
A. A/R	26	10	2,900	2,881	2,934	3,350	3,714	4,135	4,634	5,222	5,912	6,731
B. Inventory												
1. Material inputs	26	10	1,454	1,454	1,454	1,800	2,129	2,509	2,960	3,492	4,116	4,856
2. Spare parts	90	4	488	488	488	488	488	488	488	488	488	488
3. Work under process	1	260	214	214	215	242	268	297	331	372	420	477
4. Product ready for delivery	1	260	962	965	968	1,077	1,178	1,295	1,434	1,598	1,789	2,017
C. Cash on hand	90	4	3,333	3,355	3,377	3,399	3,399	3,399	3,399	3,399	3,399	3,399
D. Current assets			9,350	9,356	9,434	10,355	11,175	12,122	13,246	14,571	16,124	17,968
Current liabilities												
A. A/p	26	10	1,676	1,685	1,694	2,049	2,378	2,758	3,209	3,742	4,365	5,105
Working capital												
A. Net working capital			7,674	7,671	7,740	8,306	8,797	9,364	10,037	10,829	11,759	12,863
B. Increasing in working capital			7,674	3	69	566	0	0	0	0	0	0

PROJECT PROFILE ON DAIRY FARMING

Table 23 sales revenue in quantity

Year	Unit/M	Unit price	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Capacity utilization												
Output mix												
Raw milk	Liter		1,624,500	1,218,375	1,624,500	2,467,400	2,920,000	3,438,300	4,058,800	4,774,200	5,628,300	6,643,000
Heifers 2-3 years	Number		0.0	0.0	55	65	75	89	105	123	146	172
Male calves	Number		0.0	0.0	120	143	169	200	236	277	328	387

Table 24 Sales revenue in birr'000'

Year	Unit/M	Unit price	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Capacity utilization												
Output mix												
Raw milk	Liter	70	113,715	85,286	113,715	172,718	204,400	240,681	284,116	334,194	393,981	465,010
Heifers 2-3 years	Number	125	0.0	0.0	6,600	7,800	9,000	10,680	13,125	15,375	18,250	21,500
Male calves	Number	75	0.0	0.0	9,000	10,725	12,675	15,000	17,700	20,775	24,600	29,025
Total			113,715	85,286	129,315	191,243	226,075	266,361	314,941	370,344	436,831	515,535

PROJECT PROFILE ON DAIRY FARMING

ANNEX VI

PROJECTED NET INCOME STATEMENT

Table 25 Projected Net income statement'000'

Period	Start up			Full capacity						
	70 %	80 %	90 %	100 %						
Project year	1	2	3	4	5	6	7	8	9	10
Item description										
Product sales revenue	113,715	85,286	129,315	191,243	226,075	266,361	314,941	370,344	436,831	515,535
Less total production costs	54,663	53,626	53,218	44,793	58,320	61,128	62,878	63,540	68,642	74,823
Gross profit	59,052	31,660	76,097	146,450	167,755	205,233	252,063	306,804	368,189	440,712
Tax	20,668	11,081	26,634	51,258	58,714	71,832	88,222	107,381	128,866	154,249
Net profit	38,384	20,579	49,463	95,193	109,041	133,401	163,841	199,423	239,323	286,463
Accumulated undistributed profit	38,384	58,963	108,426	203,618	312,659	446,061	609,902	809,324	1,048,647	1,335,110

PROJECT PROFILE ON DAIRY FARMING

ANNEX VII

DEBT SERVICE SCHEDULE AND COMPUTATI

PAYMENT OF EQUAL ANNUAL INSTALLMENTS

Table 26 Debt service schedule and computation'000'

Item description	Project year									
	1	2	3	4	5	6	7	8	9	10
A. Investment and working capital										
1. Investment										
2. Increment working capital	7,674	3	69	566						
Total										
B. Loan receipts and balances										
1. Loan receipts	125,036									
2. Outstanding balance at end of year										
a. First year loan	125,036	117,737	109,598	100,524	90,405	79,123	66,544	52,518	36,879	19,442
Total										
C. Debt service										
1. First year loan										
a. Interest	14,379	13,539	12,603	11,560	10,396	9,099	7,652	6,039	4,241	2,235
b. Repayment of principal	7,299	8,138	9,074	10,118	11,281	12,579	14,025	15,638	17,437	19,442
total										

PROJECT PROFILE ON DAIRY FARMING

ANNEX VIII CASH-FLOW STATEMENT FOR FINANCIAL PLANING

Table 27 Projected cash flow statement

Period	Start up			Full capacity						
	70%	80%	90%	100%						
Project year	1	2	3	4	5	6	7	8	9	10
Item description										
A. Cash - inflow	294,014	85,292	129,393	192,164	226,075	266,361	314,941	370,344	436,831	515,535
1. Financial resource (total)	180,299	6	78	921						
2. Sales revenue	113,715	85,286	129,315	191,243	226,075	266,361	314,941	370,344	436,831	515,535
B. Cash – outflow	251,649	61,571	77,724	95,810	117,535	134,859	156,243	181,279	209,665	243,234
1. Total assets schedule including replacement	180,299	6	78	921						
2. Operating costs	29,004	28,807	29,335	33,501	37,144	41,349	46,344	52,221	59,121	67,308
3. Debt service (total)										
a. Interest	14,379	13,539	12,603	11,560	10,396	9,099	7,652	6,039	4,241	2,235
b. Repayment	7,299	8,138	9,074	10,118	11,281	12,579	14,025	15,638	17,437	19,442
4. Tax	20,668	11,081	26,634	51,258	58,714	71,832	88,222	107,381	128,866	154,249
C. Surplus (Deficit)	42,365	23,721	51,669	96,354	108,540	131,502	158,698	189,065	227,166	272,301
D. Cumulative cash balance	42,365	66,086	117,755	214,109	322,649	454,151	612,849	801,914	1,029,080	1,301,381

PROJECT PROFILE ON DAIRY FARMING

ANNEX XI

SUMMARY OF FINANCIAL EFFECIENCY TESTS

Table 28 Summary of financial efficiency tests

Project year	Project year									
	1	2	3	4	5	6	7	8	9	10
Capacity utilization	70%	80%	90%	100%						
Financial ratio in %										
1. Gross profit : Revenue	52%	37%	59%	77%	74%	77%	80%	83%	84%	85%
2. Net profit : Revenue	34%	24%	38%	50%	48%	50%	52%	54%	55%	56%
3. Net profit : initial investment	21%	12%	28%	53%	61%	74%	91%	111%	134%	160%
4. Net profit : Equity	72%	38%	92%	176%	201%	246%	302%	368%	441%	528%
5. Gross profit : Initial investment	33%	18%	43%	82%	94%	114%	141%	171%	205%	246%
6. Operating costs : Revenue	26%	34%	23%	18%	16%	16%	15%	14%	14%	13%

PROJECT PROFILE ON DAIRY FARMING

ANNEX XII

TOTAL INVESTMENT COSTS

Table 29 Total investment costs '000'

Period	Start up			Full capacity							
Project year	1	2	3	4	5	6	7	8	9	10	11
Investment Category											
1. Fixed investment costs											
a. Initial fixed investment costs	168,950										
b. Replacement											
2. Pre-operational capital expenditure	2,000										
3. Working capital increase	7,674	3	69	566							
Total investment costs		3	69	566							

ANNEX XIII

TOTAL ASSETS

Table 30 Total Assets

Period	Start up			Full capacity							
Project year	1	2	3	4	5	6	7	8	9	10	11
Investment Category											
1. Fixed investment costs											
c. Initial fixed investment costs	168,950										
d. Replacement											
2. Pre-operational capital expenditure	2,000										
3. Current assets increase	9,350	6	78	921							
Total assets	180,299	6	78	921							

PROJECT PROFILE ON DAIRY FARMING

ANNEX XIV

SOURCES OF FINANCE

Table 31 Sources of finance'000'

Period	Start up			Full capacity							
	1	2	3	4	5	6	7	8	9	10	Total
Project year											
Sources of finance											
1. Equity capital	53,587	-3	69	566							
2. Loan capital	125,037										
3. Current liabilities	1,675	9	9	355							
Total finance	180,299	6	78	921							

ANNEX XV

Calculations of payback period

Table 32 Calculation of payback period'000'

Year	Amount Paid Back			Total investment	End of year
	Net Profit	Depreciation	Total		
1	38,384	11,280	49,664	178,624	-128,960
2	20,579	11,280	31,859	-3	-97,098
3	49,463	11,280	60,743	69	-36,424
4	95,193	11,280	106,473	566	+69,483

PROJECT PROFILE ON DAIRY FARMING

ANNEX XVI

Calculations of Net present value at 17% D.F.

Table 33 Calculation of NPV AT 17% Discount factor

Project year	Gross Revenue	1/(1+i) ⁿ At 17%	Present value at 17%	Project costs			
				Total investment	Operating costs	Total	Present value at 17%
1	113,715	0.854701	97,192	178,624	29,004	207,628	177,460
2	85,286	0.730514	62,303	-3	28,807	28,804	21,042
3	129,315	0.624371	80,741	69	29,335	29,404	18,359
4	191,243	0.53365	102,057	566	33,501	34,067	18,180
5	226,075	0.456111	103,115		37,144	37,144	16,942
6	266,361	0.389839	103,838		41,349	41,349	16,119
7	314,941	0.333195	104,937		46,344	46,344	15,442
8	370,344	0.284782	105,467		52,221	52,221	14,872
9	436,831	0.243404	106,326		59,121	59,121	14,390
10	515,535	0.208037	107,250		67,308	67,308	14,003
Total			973,226				326,808

- A. Benefit- cost ratio at 10% D.F. = 2.98
- B. NPV at 10% D.F. = 646,418,000.00Birr

