PROFILE ON DAIRY FARM

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I. SUMMARY

This profile envisages the establishment of dairy farm with annual production capacity of 1,171,200 liters of milk.

The current demand for milk in Somali region is estimated at 36,944 tonnes. The demand is projected to reach 49,171 tonnes by the year 2015.

The project will create employment opportunities for about 52 persons.

The total investment cost of the project is estimated at Birr 8.04 million, out of which about Birr 2 million will be for plant machienry and equipment.

The project is financially viable with internal rate of return (IRR) of 15% and net present value (NPV) of Birr 2.25 million, discounted at 10.5%.

II. PRODUCT DESCRIPTION AND APPLICATION

Milk is a traditional constituent of the Ethiopian diet, espsecially in lowland areas where the livelihood is based on cattle production. Liquid milk handled traditionally has a very limited shelf-life. In modern dairy production exotic cross breeds or pure breed cattles are used and the milk is processed to have longer shelf-life.

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

1. Past Supply and Present Demand

According to FAO, the country's total cow milk production in year 1995 was estimated at 738 thousand tonnes. The production almost remained constant over the past seven years which lie between 738 and 750 tonnes. Currently, fresh milk is not imported. Hence, the domestic demand is supplied through local production.

However, to estimate the current demand for milk, the " 1995/96 house hold income, consumption and expenditure survey" revised and published in 1998 by CSA is used as a base. The demand estimated based on the above survey is sown in Table 3.1

Table 3.1
HOUSE HOLD CONSUMPTION OF MILK

Income Group	No of persons in the Group	Average consumption (cc)	Total consumption (Tonne)
< 600	39,733	-	-
600 -999	215,708	303	65
1000-1399	548,063	1,244	682
1400-1999	2,048,185	1,579	3,234
2000-2599	3,285,193	2,131	7,001
2600- 3399	5,746,321	4,175	23,991
3400-4199	7,014,673	8,129	57,022
4200 -5399	9,606,476	9,829	94,422
5400- 6599	7,770,271	11,326	88,006
6600- 8999	8,746,435	13,577	118,750
9000-12599	5,061,294	14,565	73,718
12600- 16199	1,331,572	15,670	20,866
16200 -19999	612,842	17,792	9,678
> 20,000	662,299	20,998	13,907
Total	**52,689,066**		**512,567**

As can be seen in the above Table, the total national consumption of milk at the time of the survey was 512,567 tonnes, considering total number of the population, which was 52,689,066 the per capita consumption will be 9.73 liters. Milk is highly perishable in nature that it is difficult to transport it and thereby exploit the maket at wider geographical coverage. Thus, considering the nature of the product it was found more appropriate to rely on the regional market rather than national. Hence, considering the per capita consumption i.e. 9.73 liters and the population of somali region which was 3,797 thousand in year 2000 (statistical abstract 2000), the current demand of Somali region is assumed to be 36,944,810 liters per annum.

2. Demand Projection

The demand for milk is assumed to grow parallel with the growth of population, hence 2.9% growth rate is used to project the future demand. Table 3.2 shows demand projection of milk in Somali region.

Table 3.2

PROJECTION DEMAND

Year	Demand for Milk ('000 liters)
2002	36,945
2003	38,016
2004	39,119
2005	40,253
2006	41,420
2007	42,623
2008	43,858
2009	45,129
2010	46,438
2011	47,785
2012	49,171

3. Pricing and Distribution

Milk proudced by traditional farmers is sold directly to consumers in the nearby towns or it is processed to butter and cheese by traditional processing means. Some small holder farmers around Addis Ababa deliver their milk to the milk collection centers that supply to the processing plant at Addis Ababa. Farmers who sale their product directly to consumers usually negotiate on the price in most cases following the local price in the market. The price of milk at national level (average price for some sellected towns) in the 1990s' is summairzed in Table 3.3.

Table 3.3

ANNUAL AVERAGE NATIONAL MILK PRICE

Year	Av. Annual Price (Birr ltr)
1990	1.05
1991	1.20
1992	1.55
1993	1.77
1994	2.04
1995	2.19
1999	2.74

Source: *CSA Retailprices of selected towns*

The envisaged project is recommended to set its price at Birr 2 per liter tonne.

The product can be distributed by estblishing own distributing stores in major towns or by using commissioned agents.

B. PLANT CAPACITY AND PRODUCTION PROGRMME

1. Plant Capacity

The dairy farm would have 160 milking cows at 80 % calving rate. The cows should be exotic breeds. Average yield per cow is estimated at 20 liters per day. Overall daily total production is about 3200 liters /day. The dairy farm will have milk processing and packing facilities. Moreover, there is also fodder (alfalfa), silage (maize) and hay (pasture) production unit for own consumption.

2. Production Programme

The dairy farm output is expected to be about 50 per cent of its full capacity at the initial year and grow to 80, and 100 per cent in the second and third year, respectively.

IV. MATERIALS AND INPUTS

A. MATERIALS

Intial stock of dairy imported breeds of 160 incalf hifers are considered. A total of about Birr 1.05 million investiment is required, out of which Birr 1.02 million is in foreign currency. The internal stock would be replaced after five years of production and then the subsiquent replacement will take place within the same time interval.

Annual inputs and feed requirement with the corrosponding estimated cost is indicated in Table 4.1.

Table 4.1

ANNUAL RAW MATERIALS AND COSTS OF DAIRY FARM AT FULL CAPACITY

No	Description	Qty	Cost, Birr in '000		
			Local	Foriegn	Total
1	Feed (tonnes)	990	148	-	148
2	Concentrate (tonnes)	140	112	-	112
3	Veterenary & A.I service	Sum	0.2	2.8	3.0
	Total	**-**	**260.2**	**2.8**	**263**

B. UTILITIES

Annual requirements of water and electricity of the dairy farm is estimated to be 10512 m^3 and 60225 Kwh, respectively. Total cost of utilities at full capacity of the farm is about Birr 22,200.

V. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Production Process

After construction and establishment of the farm including buildings, farm structures, fodder production, etc incalf heifers will be purchased from a reliable supplier. These hifers would give birth in six to nine months time and production of milk will be started nearly at the end of the the first year. Daily milk production is estimated to be 3000 to 3400 liters per day. The milk will be taken directly from the milking parlor with pipe line to a cooling tank for temporaty storage and processed immediately. One per cent of the fat content is separated and chilled in a cold store. Then, the cream is either churned to butter or sold as it is depending on the availability of local market. After cream separation process, the milk is filtered and sealed with plastic bags or bottled and distributed to the market.

2. Source of Technology

The machinery and equipment required can be supplied by Hagbes Ethiopia PLC

B. ENGINEERING

1. Machinery and Equipment

Machinery and equipment required for dairy farm are listed in Table 5.1. Total costs are estimated to be Birr 2 million, out of which Birr 1.7 million (87.7%) is in foreign currancy.

2. Land, Building and Civil Works

The dairy farm will have farm buldings and shades for cows and calves. In addition, the farm will have pasture and natural open areas. Areas of building , shades, pasture and open areas are 288 m^2, 576 m^2, 80 ha, and 1440 ha, respectively. The total cost of land, at the rate of Birr 36 per ha, and for 60 years of land holding is estimated at Birr 3.28 million. The total cost of building and civil works at the unit cost of Birr 1500 per m^2 for building and Birr 1000 for shade is estimated at Birr 1,008,000.

Free access is necessary in and round the dairy farm. Therefore, about 45 km on-farm access road will be constructed out of which 5 km would be access to the farm gate. Total rural road cnstruction cost is estimated at about Birr 600,000

3. Proposed Location

The proposed location of dairy farm will be near the outskirts of big cities like Jigjiga and Gode towns.

Table 5.1

LIST OF MACHINERY AND EQUIPMENT

No	Description	Qty	Unit price (Birr)	Tota; cost (in '000 Birr)		
				F.C	L.C	Total
1	Tractor (70 hp)	2	173,500	312.3	34.7	347.0
2	Trailers (6 ton)	2	50,000	90.0	10.0	100.0
3	Disc harrow	1	50,000	45.0	5.0	50.0
4	Dipping vat	1	50,000	45.0	5.0	50.0
5	Water pump	3	64,000	172.8	19.2	192.0
6	Cruch	1	5,000	4.5	0.5	5.0
7	Tools (miscellanous)	1	25,000	22.5	2.5	25.0
8	Water tank (7000 lts)	2	13,000	23.4	2.6	20.0
9	Vet. Clinic equipment (set)	1	50,000	45.0	5.0	50.0
	Milk processing equipment		Lump sum	939.5	215.5	1,155.0
10	Tank insulated	1				
11	External reserviour	1				
12	Parallel filters (set)	1				
13	Regulator	1				
14	Compact plate pasturizer	1				
15	Butter mold	4				
16	Butter churm for curning	1				
	Spiral air copmresser	1				
17	Water refregrator	1				
18	Centrifugal pump	1				
19	Connecting pipes, valves, etc	1				
20	Laboratort equipment	1				
21	Balance instrument	1				
22	Authomatic filter –sealer for plastic bags	1				
	Total			**1,700**	**300**	**2,000**

VI. MANPOWER AND TRAINING REQUIREMENT

A. MANPOWER REQUIREMENT

Manpower requirement of the farm and the corresponding labour cost are shown in Table 6.1 below.

Table 6.1

MAN POWER REQUIRED AND LABOUR COST

No	Description	Req. No.	Monthly salary, Birr	Annual salary, Birr
1	Dairy farm Manager	1	1500	18000
2	Time keeper	2	600	14400
3	Milk processing plant workers	4	500	24000
4	Barn workers	30	300	108000
5	Tractor operators	2	400	9600
6	Veterenarian	1	850	10200
7	Pasture area worker	10	300	72000
8	Driver	2	400	9,600
	Sub -Total	**52**		**265,800**
	Employees benefit (25%)			66,450
	Grand total	**52**		**332,250**

B. TRAINING REQUIREMENT

A two weeks training will be provided for the manager and other four workers of the dairy farm at the site of the project by the machinery supplier. Total cost of training will be Birr 28,250.

VII. FINANCIAL ANALYSIS

The financial analysis of the dairy project is based on the data presented in the previous chapters and the following assumptions:-

Construction period	2 years
Source of finance	30 % equity
	70 % loan
Tax holidays	4 years
Bank interest	10.5%
Discounted cashflow	10.5%
Land value	Based on estimated lease rate of the region
Repair and maintenance	5 % of the total plant and machinery
Accounts receivable	30 days
Raw material local	30 days
Raw materials import	90 days
Work in progress	1 day
Finished products	1 day
Cash in hand	5 days
Accounts payable	30 days

A. TOTAL INITIAL INVESTMENT COST

The total initial investment cost of the project including working capital is estimated at Birr 8.04 million, out of which about 21% will be required in foreign currency. For details see Table 7.1.

Table 7.1

INITIAL INVESTMENT COST

('000 Birr)

Sr. No.	Cost Items	Foreign Currency	Local Currency	Total
1	land	-	3,283.20	3,283.20
2.	Building and Civil Work	-	1,008.00	1,008.00
3.	Plant Machinery and Equipment	1,700.00	300.00	2,000.00
4.	Office Furniture and Equipment	-	100.00	100.00
5.	Vehicle	-	500.00	500.00
6.	Pre-production Expenditure *	-	1,124.00	1,124.00
	Total Investment cost	**1,700.00**	**6,315.20**	**8,015.20**
7	Working Capital	0.95	31.38	32.33
	Total	**1,700.95**	**6,346.55**	**8,047.5**

B. PRODUCTION COST

The annual production cost at full operation capacity is estimated at Birr 1.62 million (see Table 7.2). The material and utility cost accounts for 17 per cent while repair and maintenance take 6 per cent of the production cost.

** Pre- production expenditure include interest during construction (Birr 924,000), training (Birr 28,250) and the balance accounts for cost of registration, licensing and formation of the company including legal fees, commissioning expenses etc.*

Table 7.2

ANNUAL PRODUCTION COST ('000 BIRR)

Items	Year			
	3	5	7	10
Raw Material and Inputs	131.5	210.40	263	263
Labour direct	79.70	127.60	159.50	159.50
Utilities	11.10	17.80	22.20	22.40
Energy and Power	-	-	-	-
Spare parts	-	-	-	-
Maintenance and repair	50.00	80.00	100.00	100.00
Factory overheads	33.20	53.20	66.40	66.40
Administration Overheads	106.30	106.30	106.30	106.30
Total Operating Costs	**411.90**	**595.20**	**717.40**	**717.40**
Depreciation	405.10	405.10	405.10	365.10
Cost of Finance	580.30	567.60	505.70	421.60
Total Production Cost	**1,397.30**	**1,567.90**	**1,628.30**	**1,504.20**

C. FINANCIAL EVALUATION

1. Profitability

According to the projected income statement, the project will start generating profit in the second year of operation. Important ratios such as profit to total sales, net profit to equity (Return on equity) and net profit plus interest on total investment (return on total investment) will show an increasing trend during the life-time of the project.

The income statement and the other indicators of profitability show that the project is viable.

2. Break-even Analysis

The break-even point of the project is estimated by using income statement projection.

$$BE = \frac{\text{Fixed Cost}}{\text{Sales} - \text{Variable Cost}} = 30\ \%$$

3. Pay-Back Period

The investment cost and income statement projection are used to project the pay-back period. The project's initial investment will be fully recovered within 8 years.

4. Internal Rate of Return and Net Present Value

Based on the cashflow statement, the calculated IRR of the project is 15 % and the net present value at 10.5% discount rate is Birr 2.25 million.

D. ECONOMIC BENEFITS

The project can create employment for 52 persons. In addition to supply of the domestic needs, the project will generate Birr 4.03 million interms of tax revenue. Moreover, the Regional Government can collect employment, income tax and sales tax revenue. The establishment of such factory will have a foreign exchange saving effect to the country by substituting the current imports.