

Pre-Feasibility Study

LAYER FARM

(5000 Birds)



Small and Medium Enterprise Development Authority Government of Pakistan

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April, 2002

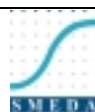
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Document No.	PREF-19
Revision	1
Prepared by	SMEDA-Punjab
Approved by	GM Punjab
Issue Date	April, 2002
Issued by	Library Officer



1 INTRODUCTION

1.1 Project Brief

Layer farm business is an agro-based project. This can be started in both rural and semi-urban areas. According to the current industry practice, poultry sheds are available on rent basis. These sheds have complete required facilities and equipment. The rent varies between Rs 0.5 to Rs 1 per square feet depending upon the location and facilities at the farm. Major portion of the cost includes bird feed.

Day old chicks of Layer are initially reared for a period of 18 weeks. On completion of 18 weeks, the birds start laying eggs for the period of next 52 weeks. On an average, one layer lays about 300 eggs per laying season of 52 weeks.

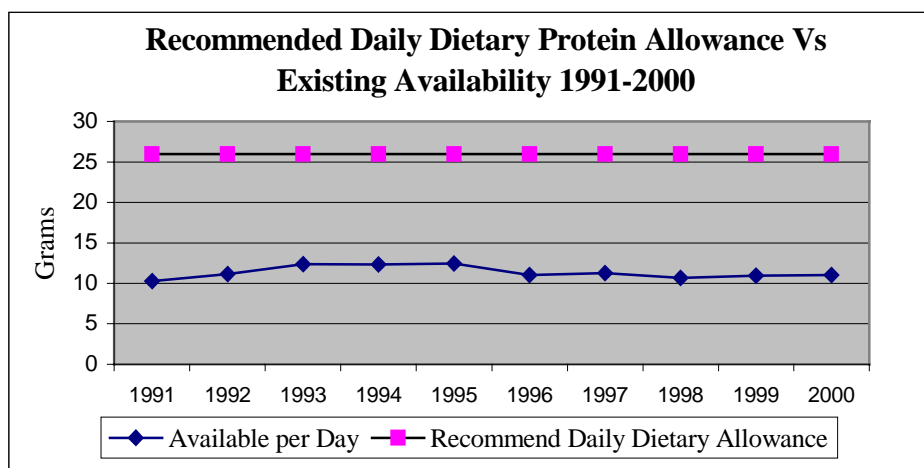
After the completion of laying period, the layers are sold in the market as culled birds. The selling price of these birds is determined on per bird basis.

1.2 Opportunity Rationale

Layer farming is a profitable business as the produce of the farm provides high quality animal protein which is daily requirement of the human body. Animal Protein is more valuable than that of plant protein.

The average availability of protein is 11 grams a day, which is far less than the recommended daily dietary protein consumption of 26 grams according to the World Health Organization standards.

Figure 1-1: Daily Protein Consumption



The figure above shows the shortage of protein availability in the country. The demand for eggs is increasing with the increase in the population. The following table shows the per capita consumption of eggs and poultry meat in 1999:

Table 1-1: Per Capita Consumption of Eggs and Poultry Meat

Per Capita	Consumption
Eggs (Nos.)	36
Poultry Meat	2.3 kg

1.3 Total Project Cost

A Poultry farm with a population of 5,000 birds started in a rented shed requires a small capital investment of about Rs 62,000 for purchasing farm machinery and equipment. A sum of about Rs 288,000 is required as working capital, which will be used for purchasing day old chicks and raw material (feed & vaccines) etc.

1.4 Proposed Capacity

5000-birds is the minimum economic size to start a layer farm, where the operational and fixed costs are justifiable. These birds are kept for sixteen months, which includes a rearing period of 4.5 months and laying period of 12 months.

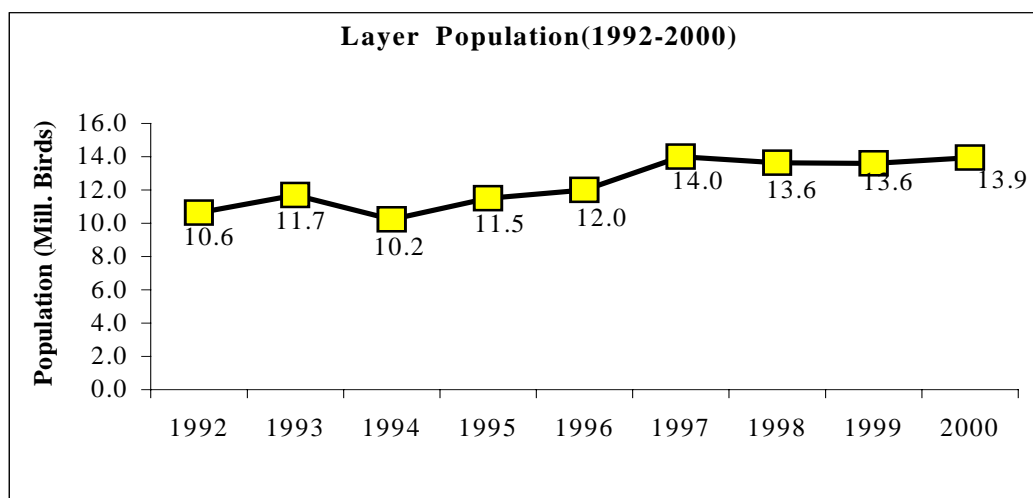
2 CURRENT INDUSTRY STRUCTURE

As of the year 1999-2000, the investment in poultry sector was about Rs 35,055 million. It included the poultry feed mills, hatcheries, layer, breeder, and broiler farms and the related infrastructure.

According to studies, approximately 38.5% of the total egg production comes from Farm eggs and the rest from Rural Poultry (Desi) eggs. In 2000, 4,509 layer farms produced 3,261 million eggs. Egg availability in Pakistan has been growing at an annual average rate of 4% during the years 1992 to 2000.

However, the poultry industry reports huge capacity under-utilization. The operational capacity of hatcheries and feed mills is reported to be far below its total installed capacity.

Layer population however, has increased at a growth rate of 3% during the last decade.

Figure 2-1: Layer Population 1992-2000¹**Table 2-1: Poultry Statistics 1999-2000²**

Poultry Statistics (1999-2000)	
Poultry Farms	Numbers
No of layer farms	4,509
Broiler farms	15,732
Breeder farms	538
Total Farms	20,779
Birds Produced/Maintained Birds	Million
Layer	13.94
Broiler	184.68
Breeder Stock	5.19
Rural Poultry	99.55
Total Birds Produced	303.36
Poultry Products	Million
Farm eggs	3,261
Rural Poultry (Desi) eggs	5,202
Total Eggs Production	8,463
Poultry Meat	'000' Tons
Culled Birds (Layer and Breeder)	13,604
Broiler	169,535
Rural Poultry (Desi)	139,796
Total Meat Produced	322,935

¹ Source: Agriculture Statistics² Source: Pakistan Poultry Research Institute

3 MARKETING

Layer starts giving eggs at the age of 15 weeks. Usually, layer farm is recommended to start in the month of February or March. The layer is ready to lay eggs in July/August. The demand for eggs is increased during the winter season and, as a result of that, the prices of eggs are also increased.

Weighted average sale price at the farm gate for the year has been taken as Rs.21 per dozen eggs sold.

Eggs are packed in trays and can be sold in bulk to the wholesale markets in the urban cities. The eggs are more liable to be damaged during transportation. The profits and losses in marketing of eggs depend on the proper transportation methods. Eggs should be transported in proper containers. Bamboo baskets, wooden boxes, and pitch board trays, collapsible cardboard boxes and in plastic trays are the containers used for transporting eggs. Of these, Bamboo baskets and wooden boxes are the safest way.

Retail buyers are also available who will directly purchase eggs from the farm. Egg is perishable commodity and cannot be stored for longer period of time. The shelf life of egg is short during summer (1 week) and long in winter season (4 weeks).

4 FARM MANAGEMENT

4.1 Purchase of Day Old Chicks

The chicks should be of uniform size, active, alert and bright eyed. The shank or leg covering (skin) of healthy chicks should appear bright and shiny. Improved and high yielding chicks should be purchased from reputed farms.

4.2 Brooding

Proper brooding temperature is required to keep the chicks in comfort during rearing period when they are sensitive to cold and need some artificial heat source to maintain their normal temperature. Coal or sawdust is burnt for supplying heat at the stage of brooding in the poultry farm.

The pre-feasibility study has taken brooding expense at Rs 1 per bird during the rearing period.

4.3 Feeding

The requirement of feed during laying depends on the rate of egg production and the body weight of layer birds. The birds may need more feed in winter and less feed in summer. During summer months the flock is under severe stress then it is suggested to temporarily change the ration to a higher level of protein content. The actual feed consumption may be influenced by several factors as follows:

- Body weight of the bird.
- Rate of egg production.
- Season and weather condition.



- Health and physical condition of the bird.
- Feed quality such as protein contents, caloric value of feed etc.

Generally the feed intake increases with an increase in egg production.

4.4 Housing

The poultry house should be well ventilated, reasonably warm in winter and cool in summer. The poultry house should be cheap, durable, comfortable and safe. Each bird should be provided a floor space of about 2 sq. ft.

4.5 Feeders

It is essential to provide adequate feeder space. Ideally, two pan type feeders are sufficient for 50 birds. Therefore, for 5000 birds, 200 feeders are enough.

4.6 Lighting

Light affects growth and reproduction of poultry birds by different physiological actions. The duration of the light period should not be decreased during laying period. Adequate lighting boosts up egg production by 5 to 10 percent. Lighting encourages the birds to eat more feed, more of which will lead to better growth and more eggs production. Irregular lighting results in drop in egg production.

4.7 Drinkers

Proper drinking space should be provided to birds. It is necessary to provide extra water during summer and extremely hot weather. Generally, one large drinker is sufficient for 50 birds. The feasibility study has therefore taken 100 large drinkers and 50 small drinkers.

4.8 Litter

Litter is spread on the floor to prevent the direct contact with the floor. Straw, rice-husk and sawdust are generally used for making the litter. It should be dry and free of moulds. Caked or moldy material should be removed and refilled with fresh materials. Extensively wet and dusty litter should also not be used. Using new litter for each flock is good for raising disease-free broiler. Litter can also be resold in the market.

4.9 Vaccination

Vaccination can be applied to chicks through injections. The medicine can also be mixed in the water and also through eye. Vaccination is provided to the birds once in the rearing period and once in the laying period. Average vaccination cost per bird usually varies between Rs 2-4. The feasibility study has taken vaccination cost at Rs 3 per bird.



4.10 Fumigation & Spraying

It is essential to disinfect all equipment and walls of the broiler house. The rooms should be white washed and sprayed before the arrival of birds.

Disinfectant solution can be prepared with Phenol, Potassium Permanganate, Carbolic Acid and Formaline. A solution of Sodium Hydroxide/Caustic Soda with warm water can also be used to clean the house.

To sanitize the layer farm from germs and insects, it is fumigated with Formaldehyde Gas, which is produced by putting Formaline on Potassium Permanganate. The rooms should be sealed for 30 minutes after the fumigation so that the gas infiltrates in every corner of the room.

4.11 Culling

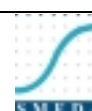
Culling is the procedure of selection and rejection of unproductive and poor producers. Culling is a very important job for running layer farm profitably. Poor layer should be culled to minimize the cost of production. The birds that have laid well for short period but have stopped laying for one reason or another should be culled out. In the feasibility study the culled birds are sold at a rate of Rs. 20 per bird.

4.12 Rearing and Laying Schedule

The cycle of one flock of layer farm is divided into two distinct phases, the rearing phase and the laying phase. During the rearing phase of 4.5 months, the birds consume feed and are non-productive. After the rearing phase is over, the birds start laying eggs and remain productive for the next 7.5 months. So, the revenues and costs occur in the form of cycles. The schedule for this calculation for the first ten years of operation of the farm is shown in Table 4-1.

Table 4-1: Schedule for calculation of Revenues and Expenses

Year	Rearing Months	Laying Months	Frequency per year					
			Birds Sale	Birds Purchased	Litter Sale	Litter Purchased	Spray Cost	Vaccination Cost
1	4.5	7.5	0	1	1	2	2	2
2	4.5	6.5	1	1	2	2	2	2
3	0	11.5	1	0	1	0	1	0
4	4.5	7.5	0	1	1	2	2	2
5	4.5	6.5	1	1	2	2	2	2
6	0	11.5	1	0	1	0	1	0
7	4.5	7.5	0	1	1	2	2	2
8	4.5	6.5	1	1	2	2	2	2
9	0	11.5	1	0	1	0	1	0
10	4.5	7.5	0	1	1	2	2	2



5 MANPOWER REQUIREMENTS

One person can handle 3000 birds easily. Two persons are sufficient to look after the 5000 birds. The feasibility has taken 2 attendants; each attendant will be paid a monthly salary of Rs 2,500.

6 FARM MACHINERY

6.1 Farm Equipment

Various types of farm equipment are needed for feeding, drinking and handling the birds. List of the required farm equipment is given in Table 6-1:

Table 6-1 Farm Equipment

Farm Equipment	Unit	Unit Cost	Total Cost
Brooders	10	450	4,500
Drum Heaters	1	1,200	1,200
Drinkers (Small)	50	60	3,000
Drinkers (Large)	100	180	18,000
Feeders	200	125	25,000
Nests	50	26	1,300
Shifting Box	5	1,800	9,000
Total	416		62,000

7 LAND & BUILDING

7.1 Recommended Mode for Acquiring Land

It is recommended that the proposed project should be started in a rented shed. This option will help us to save on the capital cost required for constructing new sheds. Normally, these sheds are located along the roadsides around the cities and rural areas.

Generally, the rate prevailing in the market is around Rs 1 per square feet.

Table 7-1 Space Requirement

Space Requirement	Required Area (Sq.ft)
Shed Space @ 2 Sq.ft/bird	10,000
Store Room	64
Rooms for Guard and Workers	144
Pavement/Driveway	510
Total Project Space Requirement	10,718
Rental Cost/Sq.ft (Rs)	1
Total Building Rental Cost (Rs) per month	10,718

7.2 Suitable Locations

Sub-urban and rural areas around the major cities of the country are recommended for starting a layer farm. Setting up a farm at an isolated place will minimize the risk of disease.

7.3 Infrastructure Requirements

- Road
- Electricity
- Water
- Drainage of rain water

8 PROJECT COST

Table 8-1: Total Project Cost

Project Costs	Rs.
Machinery & equipment	62,000
Total Fixed Costs	62,000
Raw material inventory	159,614
Prepaid building rent	128,616
Total Working Capital	288,230
Total Project Cost	350,230

Table 8-2: Financial Plan

Initial Financing		Rs. in actual
Debt	50%	175,115
Equity	50%	175,115

Table 8-3: Project Returns

	Project
IRR	34.69%
NPV (Rs)	570,986
Payback Period (years)	6.84

9 KEY SUCCESS FACTORS

- **Farm management**

Professional farm management is the key success factor to increase the birds productivity. The farm labor should be experienced enough to look after the biological/disease matters of the farm. Timely feeding and vaccination is only possible if some person is available at the farm 24 hours a day.

- **Market Information**

Sale price of eggs fluctuates during a year. Generally, the sale price of eggs is lower in summer season and higher in winter season. The entrepreneur should be well aware of this price fluctuation. This will help the entrepreneur to negotiate well the sale price of eggs.

- **Vaccination and Medication**

Mortality is the most critical component in determining the viability of a Layer farm. Some times the epidemic diseases results in heavy mortality of up to 25%. Proper vaccination and medication is very helpful to reduce the mortality loss up to 5%.

10 THREATS FOR THE BUSINESS

- **Price fluctuations in the market**

Egg prices are determined by supply and demand phenomenon in the market. The prices of eggs go up in winter season as the demand is increased.

- **Disease**

Mortality is the most alarming threat to the viability of the farm.

- **Shelf life**

Egg is a perishable commodity and cannot be stored for a long time at the room temperature. It needs to be either sold within short time or has to be stored at a cool temperature.

11 FINANCIAL ANALYSIS

11.1 Projected Income Statement

PROJECTED INCOME STATEMENT											in Rs
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	
Sales	1,510,361	1,546,687	2,912,468	2,012,287	2,058,640	3,876,496	2,678,354	2,740,050	5,159,616	3,564,890	
Cost of goods sold											
Raw Material	1,436,526	1,368,841	1,684,587	1,645,868	1,584,605	1,950,121	1,925,082	1,834,378	2,257,508	2,228,523	
Payroll (Production Staff)	60,000	63,000	66,150	69,458	72,930	76,577	80,406	84,426	88,647	93,080	
Brooding Expense	5,000	5,250	-	5,788	6,078	-	6,700	7,036	-	7,757	
Total	1,501,526	1,437,091	1,750,737	1,721,113	1,663,613	2,026,697	2,012,188	1,925,840	2,346,156	2,329,359	
Gross Profit	8,836	109,595	1,161,731	291,174	395,027	1,849,798	666,167	814,210	2,813,460	1,235,531	
Operating Expenses											
Litter Cost	5,000	5,250	-	5,788	6,078	-	6,700	7,036	-	7,757	
Spray Cost	2,500	2,625	1,378	2,894	3,039	1,595	3,350	3,518	1,847	3,878	
Fixed electricity	24,000	26,400	29,040	31,944	35,138	38,652	42,517	46,769	51,446	56,591	
Administrative Overheads	7,552	7,733	14,562	10,061	10,293	19,382	13,392	13,700	25,798	17,824	
Depreciation	6,200	6,200	6,200	6,200	6,200	6,200	6,200	6,200	6,200	6,200	
Mortality Loss	24,540	24,286	17,732	28,369	28,075	20,528	32,801	32,461	23,763	37,932	
Total	69,792	72,494	68,913	85,256	88,823	86,358	104,961	109,683	109,054	130,182	
Operating Profit	(60,956)	37,101	1,092,818	205,917	306,204	1,763,440	561,206	704,526	2,704,406	1,105,349	
Non-operating Expenses											
Financial Charges on Running Finance	28,018	83,405	118,607	29,700	12,435	-	-	-	-	-	
Building Rent	128,616	135,047	141,799	148,889	156,334	164,150	172,358	180,976	190,024	199,526	
Total	156,634	218,451	260,406	178,589	168,769	164,150	172,358	180,976	190,024	199,526	
Profit Before Tax	(217,591)	(181,351)	832,412	27,328	137,435	1,599,290	388,848	523,551	2,514,381	905,823	
Tax	-	-	166,344	-	5,808	434,752	43,270	76,388	755,033	192,038	
Profit After Tax	(217,591)	(181,351)	666,068	27,328	131,628	1,164,539	345,578	447,163	1,759,348	713,785	
Retained Earnings beginning of year	-	(217,591)	(398,941)	267,127	294,455	426,082	1,590,621	1,936,199	2,383,362	4,142,710	
Retained Earnings end of year	(217,591)	(398,941)	267,127	294,455	426,082	1,590,621	1,936,199	2,383,362	4,142,710	4,856,495	

11.2 Projected Cashflow Statement

PROJECTED CASH FLOW STATEMENT											in Rs	
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	
Operating activities												
Net profit		(217,591)	(181,351)	666,068	27,328	131,628	1,164,539	345,578	447,163	1,759,348	713,785	
Depreciation		6,200	6,200	6,200	6,200	6,200	6,200	6,200	6,200	6,200	6,200	
Accounts receivable		(125,863)	(3,027)	(113,815)	75,015	(3,863)	(151,488)	99,845	(5,141)	(201,630)	132,894	
Stocks-RM	(159,614)	7,520	(35,083)	4,302	6,807	(40,613)	2,782	10,078	(47,014)	3,221	247,614	
Cash provided by operations	(159,614)	(329,734)	(213,261)	562,755	115,350	93,352	1,022,033	461,702	401,207	1,567,138	1,100,493	
Financing activities												
Add: buliding rent expense		128,616	135,047	141,799	148,889	156,334	164,150	172,358	180,976	190,024	199,526	
Building rent payment	(128,616)	(135,047)	(141,799)	(148,889)	(156,334)	(164,150)	(172,358)	(180,976)	(190,024)	(199,526)	(209,502)	
Repayment of Running Finance		(175,115)	(521,279)	(741,292)	(185,627)	(77,722)	0	0	0	0	0	
Issuance of share	175,115											
Cash provided by/used for financing activities	46,499	(181,546)	(528,032)	(748,382)	(193,072)	(85,539)	(8,208)	(8,618)	(9,049)	(9,501)	(9,976)	
Total	(113,115)	(511,279)	(741,292)	(185,627)	(77,722)	7,814	1,013,825	453,084	392,159	1,557,637	1,090,516	
Investing activities												
Capital expenditure	(62,000)											
Cash provided by/used for investing activities	(62,000)											
Net Cash	(175,115)	(511,279)	(741,292)	(185,627)	(77,722)	7,814	1,013,825	453,084	392,159	1,557,637	1,090,516	
Cash balance brought forward	0	0	10,000	10,000	10,000	10,000	17,814	1,031,639	1,484,722	1,876,881	3,434,518	
Cash Balance	(175,115)	(511,279)	(731,292)	(175,627)	(67,722)	17,814	1,031,639	1,484,722	1,876,881	3,434,518	4,525,034	
Running Finance	175,115	521,279	741,292	185,627	77,722	0	0	0	0	0	0	
Cash carried forward	-	10,000	10,000	10,000	10,000	17,814	1,031,639	1,484,722	1,876,881	3,434,518	4,525,034	

11.3 Projected Balance Sheet

PROJECTED BALANCE SHEET											in Rs
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Current Assets											
Cash	0	10,000	10,000	10,000	10,000	17,814	1,031,639	1,484,722	1,876,881	3,434,518	4,525,034
Stocks and Inventory	159,614	152,093	187,176	182,874	176,067	216,680	213,898	203,820	250,834	247,614	0
Receivable	0	125,863	128,891	242,706	167,691	171,553	323,041	223,196	228,337	429,968	297,074
Pre-paid building rent	128,616	135,047	141,799	148,889	156,334	164,150	172,358	180,976	190,024	199,526	209,502
Total	288,230	423,004	467,866	584,469	510,091	570,197	1,740,936	2,092,714	2,546,077	4,311,625	5,031,610
Gross Fixed Assets											
Gross Fixed Assets	62,000	62,000	62,000	62,000	62,000	62,000	62,000	62,000	62,000	62,000	62,000
Less: Accumulated depreciation	0	6,200	12,400	18,600	24,800	31,000	37,200	43,400	49,600	55,800	62,000
Net Fixed Assets	62,000	55,800	49,600	43,400	37,200	31,000	24,800	18,600	12,400	6,200	0
Total Assets	350,230	478,804	517,466	627,869	547,291	601,197	1,765,736	2,111,314	2,558,477	4,317,825	5,031,610
Current Liabilities											
Running Finance	175,115	521,279	741,292	185,627	77,722	0	0	0	0	0	0
Total	175,115	521,279	741,292	185,627	77,722	0	0	0	0	0	0
Equity											
Paid-up Capital	175,115	175,115	175,115	175,115	175,115	175,115	175,115	175,115	175,115	175,115	175,115
Retained Earnings	0	(217,591)	(398,941)	267,127	294,455	426,082	1,590,621	1,936,199	2,383,362	4,142,710	4,856,495
Total	175,115	(42,476)	(223,826)	442,242	469,570	601,197	1,765,736	2,111,314	2,558,477	4,317,825	5,031,610
Total Liabilities And Equity	350,230	478,804	517,466	627,869	547,291	601,197	1,765,736	2,111,314	2,558,477	4,317,825	5,031,610

12 KEY ASSUMPTIONS

Table 12-1: Production Assumptions

Maximum Capacity Utilization	100%
Number of Birds per Flock	5,000
Number of Flocks per Year	1
Total Mortality Rate	5%
Mortality Rate (Rearing Period)	3%
Mortality Rate (Laying Period)	2%
Total Mortality Loss (Birds)	250
Total number of Birds Laying Eggs	4,750
Length of Rearing Period (Months)	4.5
Length of Laying Period (Months)	12
Lag time between the Flock(Weeks)	2

Table 12-2: Economy Related Assumptions

Electricity growth rate	10%
Wage growth rate	5%

Table 12-3: Expense Assumptions

Administrative overhead (% of Sales)	0.5%
Raw material price growth rate	5%
DOC Cost (Day Old Chicks)	20
Weight of Feed Bag(Kg)	50
Feed Cost/Bag	518
Rearing Period Feed Consumption/Bird/Month(Kg)	1.33
Rearing Period Cost of Feed/Bird/Month	13.78
Laying Period Feed Consumption/Bird/Month(Kg)	2.7
Laying Period Cost of Feed/Bird/Month	27.97
Vaccination Cost per Bird	3
Spray Cost per Flock	1,250
Litter Cost per Flock	2,500
Electricity Expense per Month	2,000
Pre-paid building Rent (Months)	12

Table 12-4: Revenue Assumptions

Number. of eggs laid/Bird/Month (Dozens)	2
Availability of Eggs in Year 1 (Months)	7.5
Production Capacity in Year 1 (Dozens)	71,250
Eggs selling price (per Dozen)	21
Birds selling price	20
Litter selling price (per Flock)	1,500
Feed Bags selling price (in Rs)	5
Sales price growth rate	10%

Table 12-5: Cashflow Assumptions

Raw Material Inventory (Days)	40
Accounts Receivable Cycle(Days)	30

Table 12-6: Financial Assumptions

Project life (Years)	10
Debt	50%
Equity	50%
Interest rate on long-term debt	16%
Interest rate on short term debt	16%
Debt tenure (Years)	5
Debt payments per year	1
Discount rate (weighted Avg. cost of capital for NPV)	20%
Minimum Cash Balance	10,000