

Pre-Feasibility Study

LAYER FARM (10000 Birds)



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Ministry of Industries & Production

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1 INTRODUCTION

1.1 Project Brief

Layer farm business is an Live Stock 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 1.5 to Rs 2 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 **5-6 months**. On completion of **5-6 months**, the birds then start laying eggs for a period of next **52 weeks (12 months)**. On an average, one layer lays about **300 eggs** per laying season of **52 weeks**.

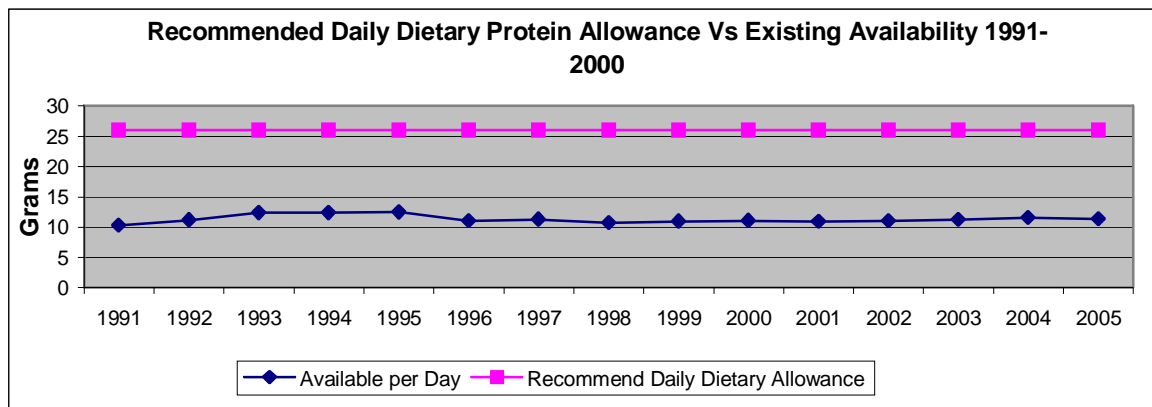
After the completion of laying period, the layers are sold in the market as culled birds. The selling price of these birds is determined on per bird basis.

1.2 Opportunity Rationale

Layer farming is a vital source for providing high quality animal protein (Eggs) which is daily requirement of the human body. Animal Protein is more valuable than that of plant protein.

The average availability of protein in Pakistan 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 figures above show 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 2005:

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

Per Capita	Consumption
Eggs (Nos.)	57
Poultry Meat	2.5 kg

1.3 Total Project Cost

A Poultry farm with a population of 10,000 birds started in a rented shed requires a small capital investment of about Rs 136,000 for purchasing farm machinery and equipment. A sum of about Rs 777,778 is required as working capital, which will be used to purchase day old chicks and raw material (feed & vaccines) etc.

1.4 Proposed Capacity

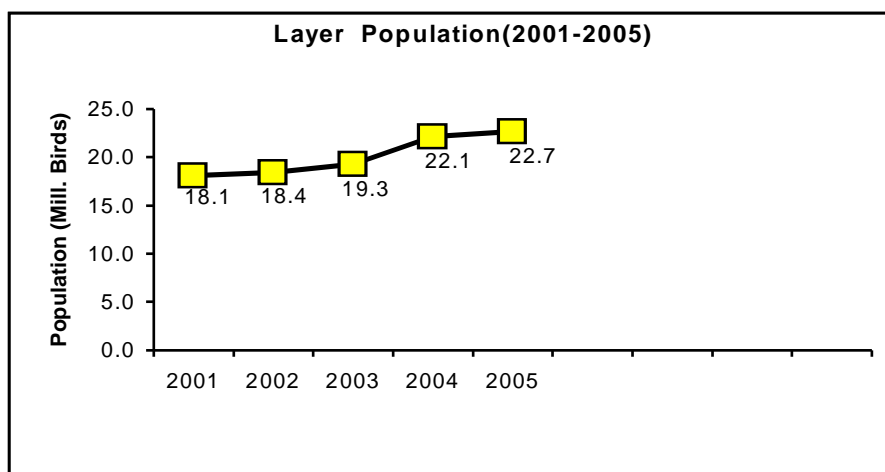
10000-birds are viable economic size to start a layer farm, where the operational and fixed costs are justifiable. These birds are kept for eighteen months, which includes a rearing period of 6 months and laying period of 12 months.

2 CURRENT INDUSTRY STRUCTURE.

According to studies, approximately 58.5% of the total egg production comes from Farm eggs and the rest from Rural Poultry (Desi) eggs. In 2005, 4,886 layer farms produced 4,992 million eggs. Egg availability in Pakistan has been growing at an annual average rate of 2.6% during the years 2001 to 2005.

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 4.5% during the last five years.

Figure 2-1: Layer Population 2001-05¹**Table 2-1: Poultry Statistics 2004-05²**

Poultry Statistics (2004-05)	
Poultry Farms	Numbers
No of layer farms	4,866
Broiler farms	17,405
Breeder farms	623
Total Farms	22,894
Birds Produced/Maintained Birds	Million
Layer	22.69
Broiler	292.05
Breeder Stock	6.78
Total Birds Produced	321.52
Poultry Products	Million
Farm eggs	4,992
Rural Poultry (Desi) eggs	3,526
Total Eggs Production	8,518
Poultry Meat	000 Tons
Culled Birds (Layer and Breeder)	21.2
Broiler	101
Rural Poultry (Desi)	294.05
Total Meat Produced	416.25

¹ Source: Livestock Wing² Source: Livestock Wing

3 MARKETING

Layer starts giving eggs at the age of **26 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.33** 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 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 lying 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, 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 1.5 to 2 sq. ft. The calculations in the feasibility are based on an area of 1.75 sq. ft. per bird.

4.5 Feeders

It is essential to provide adequate feeder space. Ideally, two pan type feeders are sufficient for 50 birds. Therefore, for 10000 birds, 400 feeders are enough.

4.6 Lighting

Light affects growth and reproduction of 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 200 large drinkers and 100 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. Sales price varies in a range of Rs.35 to 50. In the feasibility study the culled birds are sold at a rate of **Rs. 40** 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 6 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 **12** 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	6	6	0	1	1	2	2	2
2	5	6	1	1	2	2	2	2
3	1	11	1	0	1	0	1	0
4	6	5	0	1	1	2	2	2
5	3	8	1	1	2	2	2	2
6	3	9	1	0	1	0	1	0
7	6	5	0	1	1	2	2	2
8	1	10	1	1	2	2	2	2
9	5	7	1	0	1	0	1	0
10	6	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 4 attendants; each attendant will be paid a monthly salary of Rs 3,500.

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	20	600	12,000
Drum Heaters	2	1,200	2,400
Drinkers (Small)	100	90	9,000
Drinkers (Large)	200	180	36,000
Feeders	400	140	56,000
Nests	100	26	2,600
Shifting Box	10	1,800	18,000
Total	832		136,000

7 LAND & BUILDING

7.1 Recommended Mode for Acquiring Land

It is recommended that the proposed project should be started on 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 1.25 per square feet.

Table 7-1 Space Requirement

Space Requirement	Required Area (Sq.ft)
Shed Space @ 2 Sq.ft/bird	20,000
Store Room	64
Rooms for Guard and Workers	144
Pavement/Driveway	510
Total Project Space Requirement	20,718
Rental Cost/Sq.ft (Rs)	1.25
Total Building Rental Cost (Rs) per month	26,000

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	136,000
Total Fixed Costs	136,000
Raw material inventory	467,008
Prepaid building rent	310,770
Total Working Capital	777,778
Total Project Cost	913,778

Table 8-2: Financial Plan

Initial Financing		Rs. in actual
Debt	0%	0
Equity	100%	913,778

Table 8-3: Project Returns

	Project
IRR	35.92%
NPV (Rs)	2,105,675
Payback Period (years)	5.480

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 10%.

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. In this regard, Bird flu is considered to be the most fatal issue, according to a study, during Bird Flu 40% of the investors withdraws their investment from the industry.

- **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

Const Year	Year-1	Year-2	Year-3	Year-4	Year-5	Year-6	Year-7	Year-8	Year-9	Year-10
Sales	3,745,020	4,516,677	8,720,313	4,161,105	7,826,508	9,610,445	5,538,431	12,832,594	10,134,438	7,371,652
COST OF GOODS SOLD										
Raw Material	4,076,752	4,019,329	4,870,307	4,198,345	4,969,276	5,305,768	4,955,379	6,118,832	5,757,502	5,736,470
Payroll (Production Staff)	168,000	176,400	185,220	194,481	204,205	214,415	225,136	236,393	248,213	260,623
Machine Maintenance	0	0	0	0	0	0	0	0	0	0
Direct Electricity	-	-	-	-	-	-	-	-	-	-
Brooding Expense	10,000	10,500	0	11,576	12,155	0	13,401	14,071	0	15,513
Direct Water	0	0	0	0	0	0	0	0	0	0
Total	4,254,752	4,206,229	5,055,527	4,404,403	5,185,637	5,520,183	5,193,916	6,369,296	6,005,715	6,012,607
Gross Profit	(509,732)	310,448	3,664,786	(243,297)	2,640,871	4,090,261	344,515	6,463,298	4,128,723	1,359,045
OPERATING EXPENSE										
Payroll (Admin)	0	0	0	0	0	0	0	0	0	0
Payroll (Marketing and Sale)	0	0	0	0	0	0	0	0	0	0
Litter Cost	10,000	10,500	0	11,576	12,155	0	13,401	14,071	0	15,513
Spray Cost	5,000	5,250	2,756	5,788	6,078	3,191	6,700	7,036	3,694	7,757
Fixed electricity	102,000	112,200	123,420	135,762	149,338	164,272	180,699	198,769	218,646	240,511
Insurance Expense	0	0	0	0	0	0	0	0	0	0
Administrative & Factory Overheads	18,725	22,583	43,602	20,806	39,133	48,052	27,692	64,163	50,672	36,858
Amortization (Pre-operational Expenses)	0	0	0	0	0	0	0	0	0	0
Depreciation	13,600	13,600	13,600	13,600	13,600	13,600	13,600	13,600	13,600	13,600
Mortality loss	128,511	121,873	64,783	143,893	121,076	96,002	166,574	116,999	135,454	192,830
Total	277,836	286,007	248,160	331,425	341,379	325,117	408,667	414,638	422,066	507,069
Operating Profit	(787,568)	24,442	3,416,625	(574,722)	2,299,492	3,765,144	(64,151)	6,048,660	3,706,657	851,976
NON-OPERATING EXPENSE										
Financial Charges on Long-term Loan	0	0	0	0	0	0	0	0	0	0
Financial Charges on Running Finance	0	195,531	271,981	21,819	95,801	0	0	0	0	0
Land Lease	0	0	0	0	0	0	0	0	0	0
Building Rental	273,270	300,597	330,657	363,722	400,095	440,104	484,114	532,526	585,779	644,356
Total	273,270	496,128	602,638	385,542	495,895	440,104	484,114	532,526	585,779	644,356
PROFIT BEFORE TAX	(1,060,838)	(471,686)	2,813,988	(960,264)	1,803,596	3,325,040	(548,266)	5,516,135	3,120,879	207,620
Tax	0	0	562,798	0	360,719	665,008	0	1,103,227	624,176	41,524
PROFIT AFTER TAX	(1,060,838)	(471,686)	2,251,190	(960,264)	1,442,877	2,660,032	(548,266)	4,412,908	2,496,703	166,096
Retained Earnings beginning of year	0	(1,060,838)	(1,532,524)	718,666	(241,598)	1,201,280	3,861,312	3,313,046	7,725,953	10,222,657
Retained Earnings end of year	(1,060,838)	(1,532,524)	718,666	(241,598)	1,201,280	3,861,312	3,313,046	7,725,953	10,222,657	10,388,752

11.2 Projected Cash flow Statement

	Const Year	Year-1	Year-2	Year-3	Year-4	Year-5	Year-6	Year-7	Year-8	Year-9	Year-10	
Operating activities												
Net profit		(1,060,838)	(471,686)		2,251,190	(960,264)	1,442,877	2,660,032	(548,266)	4,412,908	2,496,703	166,096
Amortization (Pre-operational Expenses)		0	0		0	0	0	0	0	0	0	0
Depreciation		13,600	13,600		13,600	13,600	13,600	13,600	13,600	13,600	13,600	13,600
Accounts receivable		(312,085)	(64,305)		(350,303)	379,934	(305,450)	(148,661)	339,334	(607,847)	224,846	230,232
Equipment Spare Parts Inventory		0	0		0	0	0	0	0	0	0	0
Up-Front Insurance payment		0	0		0	0	0	0	0	0	0	0
Stocks-RM		(452,972)	0	6,380	(94,553)	74,662	(85,659)	(37,388)	38,932	(129,273)	40,148	2,337
Accounts payable		0	0		0	0	0	0	0	0	0	0
Cash provided by operations		(452,972)	(1,359,323)	(516,011)	1,819,934	(492,067)	1,065,368	2,487,583	(156,399)	3,689,388	2,775,297	412,265
Financing activities												
Long term debt principal repayment		0	0		0	0	0	0	0	0	0	0
Add: building rent expense		273,270	300,597		330,657	363,722	400,095	440,104	484,114	532,526	585,779	644,356
Building rent payment		(273,270)	(300,597)		(363,722)	(400,095)	(440,104)	(484,114)	(532,526)	(585,779)	(644,356)	(708,792)
Addition to long term debt		0	0		0	0	0	0	0	0	0	0
Repayment of Running Finance		0	(1,396,650)		(1,942,720)	(155,852)	(684,291)	0	0	0	0	0
Issuance of share		862,242										
Cash provided by/ (used for) financing activities		588,972	(27,327)	(1,426,710)	(1,975,786)	(192,224)	(724,301)	(44,010)	(48,411)	(53,253)	(58,578)	(64,436)
Total	136,000	(1,386,650)	(1,942,720)		(155,852)	(684,291)	341,067	2,443,572	(204,811)	3,636,135	2,716,719	347,829
Investing activities												
Capital expenditure		(136,000)										
Cash (used for)/ provided by investing activities		(136,000)										
Net Cash	0	(1,386,650)	(1,942,720)		(155,852)	(684,291)	341,067	2,443,572	(204,811)	3,636,135	2,716,719	347,829
Cash balance brought forward	0	0	10,000		10,000	10,000	10,000	351,067	2,794,640	2,589,829	6,225,964	8,942,684
Cash Balance	0	(1,386,650)	(1,932,720)		(145,852)	(674,291)	351,067	2,794,640	2,589,829	6,225,964	8,942,684	9,290,513
Running Finance	0	1,396,650	1,942,720		155,852	684,291	0	0	0	0	0	0
Cash carried forward	-	10,000	10,000		10,000	10,000	351,067	2,794,640	2,589,829	6,225,964	8,942,684	9,290,513

11.3 Projected Balance Sheet

	Const Year	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	351,067	2,794,640	2,589,829	6,225,964	8,942,684	9,290,513
Equipment Spare Parts Inventory	0	0	0		0	0	0	0	0	0	0	0
Up-Front Insurance payment	0	0	0		0	0	0	0	0	0	0	0
Stocks and Inventory	452,972	452,972	446,592		541,145	466,483	552,142	589,530	550,598	679,870	639,722	637,386
Receivable	0	312,085	376,390		726,693	346,759	652,209	800,870	461,536	1,069,383	844,536	614,304
Pre-paid building rent	273,270	300,597	330,657		363,722	400,095	440,104	484,114	532,526	585,779	644,356	708,792
Total	726,242	1,075,654	1,163,639		1,641,560	1,223,336	1,995,522	4,669,154	4,134,488	8,560,996	11,071,299	11,250,995
Gross Fixed Assets												
	136,000	136,000	136,000		136,000	136,000	136,000	136,000	136,000	136,000	136,000	136,000
Less: Accumulated depreciation	0	13,600	27,200		40,800	54,400	68,000	81,600	95,200	108,800	122,400	136,000
Net Fixed Assets	136,000	122,400	108,800		95,200	81,600	68,000	54,400	40,800	27,200	13,600	0
Intangible Assets												
Pre-operational Expenses	-	0	0		0	0	0	0	0	0	0	0
Total	0	0	0		0	0	0	0	0	0	0	0
Total Assets	862,242	1,198,054	1,272,439		1,736,760	1,304,936	2,063,522	4,723,554	4,175,288	8,588,196	11,084,899	11,250,995
Current Liabilities												
Running Finance	0	1,396,650	1,942,720		155,852	684,291	0	0	0	0	0	0
Accounts payable		0	0		0	0	0	0	0	0	0	0
Total	0	1,396,650	1,942,720		155,852	684,291	0	0	0	0	0	0
Long-term liabilities												
Long-term Loan	0	0	0		0	0	0	0	0	0	0	0
Total	0	0	0		0	0	0	0	0	0	0	0
Equity												
Paid-up Capital	862,242	862,242	862,242		862,242	862,242	862,242	862,242	862,242	862,242	862,242	862,242
Retained Earnings	0	(1,060,838)	(1,532,524)		718,666	(241,598)	1,201,280	3,861,312	3,313,046	7,725,953	10,222,657	10,388,752
Total	862,242	(198,595)	(670,282)		1,580,908	620,645	2,063,522	4,723,554	4,175,288	8,588,196	11,084,899	11,250,995
Total Liabilities And Equity	862,242	1,198,054	1,272,439		1,736,760	1,304,936	2,063,522	4,723,554	4,175,288	8,588,196	11,084,899	11,250,995

12 KEY ASSUMPTIONS

Table 12-1: Production Assumptions

Maximum Capacity Utilization	100%
Number of Birds per Flock	10,000
Number of Flocks per Year	1
Total Mortality Rate	10%
Mortality Rate (Rearing Period)	8%
Mortality Rate (Laying Period)	2%
Total Mortality Loss (Birds)	1000
Total number of Birds Laying Eggs	9,000
Length of Rearing Period (Months)	6
Length of Laying Period (Months)	12
Lag time between the Flock(Weeks)	4

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)	25
Weight of Feed Bag(Kg)	50
Feed Cost/Bag	638
Rearing Period Feed Consumption/Bird/Month(Kg)	1.95
Rearing Period Cost of Feed/Bird/Month	24.88
Laying Period Feed Consumption/Bird/Month(Kg)	3.3
Laying Period Cost of Feed/Bird/Month	42.11
Vaccination Cost per Bird	3
Spray Cost per Flock	5,000
Litter Cost per Flock	3,000
Electricity Expense per Month	8,500
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)	6
Production Capacity in Year 1 (Dozens)	122,708
Eggs selling price (per Dozen)	33
Birds selling price	40
Litter selling price (per Flock)	3,000
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(S.T debt will only be considered in case of Loss)	0%
Equity	100%
Interest rate on long-term debt	14%
Interest rate on short term debt	14%
Debt tenure (Years)	5
Debt payments per year	1
Discount rate (weighted Avg. cost of capital for NPV)	17%
Minimum Cash Balance	10,000