

Pre-Feasibility Study

BROILER FARM (7500 Birds)



Small and Medium Enterprises Development Authority

Ministry of Industries & Production

Government of Pakistan

www.smeda.org.pk

HEAD OFFICE

4th Floor, Building No. 3, Aiwan-e-Iqbal Complex, Egerton Road,
Lahore

Tel: (92 42) 111 111 456, Fax: (92 42) 36304926-7
helpdesk@smeda.org.pk

REGIONAL OFFICE PUNJAB	REGIONAL OFFICE SINDH	REGIONAL OFFICE KPK	REGIONAL OFFICE BALOCHISTAN
3 rd Floor, Building No. 3, Aiwan-e-Iqbal Complex, Egerton Road Lahore, Tel: (042) 111-111-456 Fax: (042) 36304926-7 helpdesk.punjab@smeda.org.pk	5 th Floor, Bahria Complex II, M.T. Khan Road, Karachi. Tel: (021) 111-111-456 Fax: (021) 5610572 helpdesk-khi@smeda.org.pk	Ground Floor State Life Building The Mall, Peshawar. Tel: (091) 9213046-47 Fax: (091) 286908 helpdesk-pew@smeda.org.pk	Bungalow No. 15-A Chaman Housing Scheme Airport Road, Quetta. Tel: (081) 831623, 831702 Fax: (081) 831922 helpdesk-qta@smeda.org.pk

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1 INTRODUCTION

1.1 Project Brief

The broiler farm is a project of livestock sector, in which, the day old chicks (DOCs) are raised on high protein feed for a period of six weeks. This business can be started both in rural and semi-urban areas in sheds. The Poultry sheds can be acquired on rental basis. These sheds have all the required facilities for the broiler farm. The rent cost varies between Rs 1.5 to Rs 2.50 per square feet depending upon the location and facilities at the farm.

The broiler birds are sold to traders and the whole sellers markets in the urban areas. Some times birds can also be sold directly to the shopkeepers in the urban markets.

Broiler farming is a profitable venture depending on the demand of the meat in the market. Annually, six flocks of birds will be raised on the same premises of a farm.

1.2 Opportunity Rationale

Broiler meat is the cheapest source of animal protein available in the country. The time required for raising broiler birds is lesser than that for big animals. The consumption of white meat is increasing due to growing health consciousness in the masses.

According to the Agriculture Statistics of Pakistan the per capita consumption of poultry meat is increasing at a rate of 4% per annum.

Per capita meat consumption in Pakistan is still very low at 17.5 kg. per annum per person which is far below the recommended dietary allowance (RDA) levels. In contrast Per capita meat consumption in developed countries is 41 kg per person while in developing countries it is 28.9 kg per person.

Figure 1-1: Per Capita Availability of Meat ¹

	000 Tones							
(July-June)	2001 -02	2002 -03	2003 -04	2004 -05	2005 -06	2006- 07	2007- 08	2008- 09
1. Total Production*	2073	2134	2185	2238	2419	2618	2728	2843
2. Per Capita Availability (Kgs/annum)	14.50	14.65	14.74	15.19	15.31	16.69	17.15	17.50

* = Includes beef, mutton and poultry meat.

1.3 Total Project Cost

A broiler farm with a population of 7,500 birds established in a rented building needs a capital investment of about Rs 174,560 for purchasing farm machinery and equipment. In addition to this, a sum of Rs 857,676 is required as working capital,

¹ Source: Economic Survey 2008-09, Finance Division, Government of Pakistan

which will be used for purchasing day old chicks and raw material (feed & vaccines) etc.

1.4 Proposed Capacity

In this pre-feasibility study, all the calculations have been based on a flock size of 7,500 birds, with raising six flocks per year. There will be a lag time of two weeks for cleaning and fumigation of the farm.

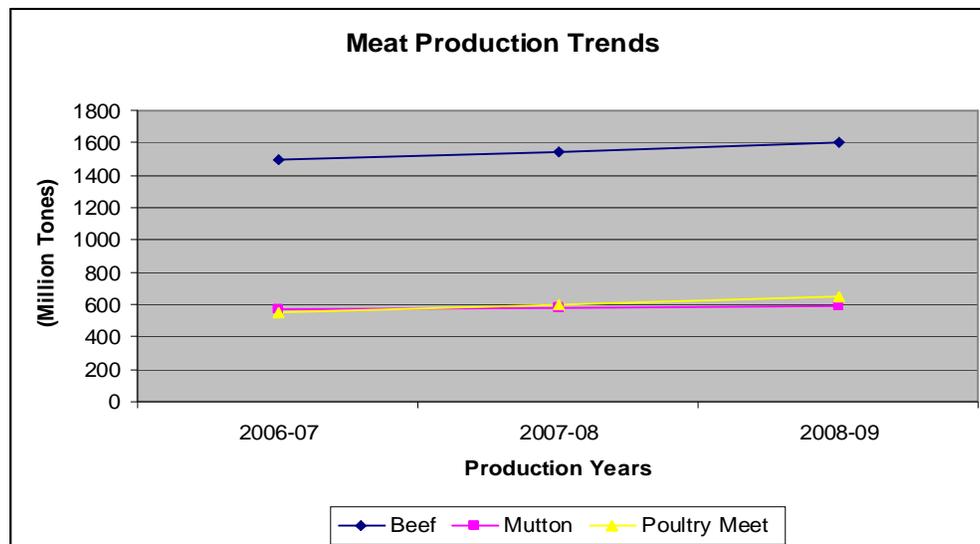
2 CURRENT INDUSTRY STRUCTURE

The generation line of broiler comes from pure line (Strains) that make the Great Grand Parents (GGP), which are imported. These great grand parents produce grand parents which are available in Pakistan. These grand parents produce parent stocks (Breeders) and parent stock end up in producing the final product which is broiler. Pakistan's poultry industry is importing 100,000 Grandparents (GP) chicks annually from Australia, Holland, Germany and USA with the cost of US\$100 per day-old female chick. The farmers get day old broiler from hatcheries. These hatcheries maintain their breeder farms, or in some cases, purchase their hatching eggs from breeder farms. These breeder farms depend on producers of parent stock.

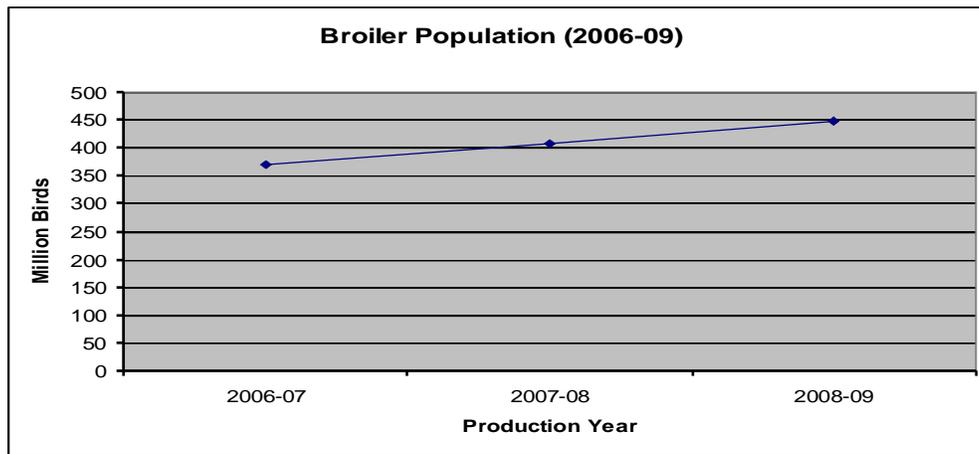
Poultry feed mills are the major player in the poultry industry, which produce a specific formula feed mix. Poultry feed consists of rich protein elements like grains, gluten, blood meal, fishmeal and soyabean meal. The major component of cost of production of chicken meat accounts for feed cost.

The poultry meat production has shown a growing trend over the past few years after a dip in 1997 due to the ban imposed on wedding dinners. The meat production trend of chicken meat, beef and mutton from the year 2006 to 2009 is presented below.

Figure 2-1: Meat Production Trends²



²Source: Ministry of Livestock and Dairy Development

Figure 2-2: Broilers' Population (2006-2009)

3 MARKETING

The marketing of chickens follows the traditional channels of distribution. Generally, broilers are distributed in the market through middlemen (Arti) and wholesalers. The role of Arti is to identify a farm and negotiate the price. In some cases, the middleman provides Day Old Chicks and other farm inputs (feed, etc.) to the broiler farmers and then agrees to buy back the mature birds from them.

Birds are transported to the urban market and are sold to retailers or market-street poultry shops. Birds are sold on live-weight basis. The time spent in getting broilers from the farm to the retail shop is brief. Although collection and handling of birds has improved with the use of loader vehicles, but it is an established fact that greater the distance between the poultry producer and consumer, more complicated is the marketing system including their collection, handling and transportation to the consumer or processing plants. The processing plant produces dressed chicken (slaughtered and cleaned). However, a very small amount of dressed chicken is available in the local retail market. The integrated processing units distribute frozen and dressed chicken packed in whole or cut-ups to the consumer through retail shops under their brand names.

The trick in marketing is quick availability of market information of chicken supply and demand, which will determine the selling price.

4 FARM MANAGEMENT

Farm input required for a broiler farm includes farm equipment (drinkers, feed trays, brooders, and feeders), electronic fixtures and other consumer items (feed, vaccines & medicines, rice-husk or saw-dust, water, electricity, etc.).

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 appears bright and shiny.

4.2 Brooding

Proper brooding temperature is required to keep the chicks in comfort. Coal or sawdust is burnt for supplying heat at the stage of brooding in the poultry farm.

In the first week, 95°F is quite comfortable. For the first one week, it is also essential to observe four to five times daily the condition (temperature) of the chicks. They should neither huddle nor move away from the brooding hover, but should be moving around evenly. As chicks grow, the temperature may be reduced at a rate of 5°F per week until approximately 70°F is reached in the sixth week.

4.3 Feeding

Broilers are usually fed with the following two types of ration:

- **Broiler starter:** It is fed to the broiler birds up to five weeks of age.
- **Broiler finisher:** It is fed to the broiler of more than five weeks of age and continued till the age of marketing.

Feeding three or four times each day will stimulate feed intake and prevents wastage. Percentage requirement of different ingredients in starter and finisher diet is given in Table 4-1:

Table 4-1: Broiler Starter & Finisher Diet

Ingredients	Starter diet (% required)	Finisher diet (% required)
Maize	44.25	44.10
Rice Polish	10.00	20.00
Groundnut cake	15.00	11.00
Sunflower cake	15.00	11.00
Fish meal	6.00	5.30
Meat meal	6.00	5.50
Blood meal	0.25	0.2
Animal fat	2.00	1.25
Bone meal	0.75	0.6
Limestone	0.5	0.7
Salt	0.25	0.25
Mineral and Vitamin mixture	0.1	0.1
Total	100.00	100.00

This starter and finisher feed can be obtained in prepared form, from the feed mills.

4.4 Housing

The chicks should be kept in a clean, dry and well-ventilated room. Broiler house should have proper ventilation as this provides the birds fresh air and carries off moisture. The entire building including litter and all equipment should be fumigated.

4.5 Feeders

It is essential to provide adequate feeder space. Ideally, one pan type feeder is sufficient for 50 birds. Therefore, for 7500, birds 150 feeders would be more than enough.

4.6 Lighting

Most broiler growers provide 24 hours light during brooding and early growing period. Recent research conducted in windowless buildings, using intermittent lighting of 1-2 hours period, has indicated significantly improved feed efficiency. Initially, for first fifteen days, light intensity should be 40-60 watts per 200 sq. ft of space and this can be replaced by 15 watts bulb in the beginning of third week. The feasibility has taken monthly electricity charges of Rs 4500.

4.7 Drinkers

Adequate drinking space should also be provided to the birds. The drinker should contain fresh, clean and cold water. It is necessary to provide extra water during summer. One drinker is sufficient for 50 birds.

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.

4.9 Vaccination

Vaccination can be provided to chicks through injections, can also be mixed in the water and also through eye drops. Average vaccination price per bird mostly varies between Rs 2-4. The feasibility has taken cost of vaccination at Rs 3 per bird.

4.10 Fumigation and Spraying

It is essential to check all equipment and walls of the broiler house carefully that they are clean, and washed with disinfectant solution, and dried. 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 broiler house from germs and insects, it is fumigated with Formaldehyde Gas, which is produced by putting Formaline on Potassium Permanganate. The rooms should be vacant and sealed for 30 minutes after the fumigation so that the gas infiltrates in every corner of the room.

In the pre-feasibility report, the cost of fumigation has been taken as Rs 2,000 per flock.

5 MANPOWER REQUIREMENTS

Semi skilled workers are needed to look after the feeding, vaccination and cleaning operations at the farm. A single person can handle 3,000 birds easily. Two people will be hired to manage the operations of a broiler farm of 7,500 birds. Each attendant is given a monthly salary of Rs 6,000. In addition, a supervisor will also be hired at a monthly salary of Rs. 10,000.

Table 5 Human Resource Requirement Details

Description – HR Requirements	Nos	Salary per month	Salary per year
Supervisor	1	10,000	120,000
Farm attends	2	12,000	144,000
Total	3	22,000	264,000

6 FARM EQUIPMENT

Various types of farm equipments are needed for feeding, drinking and handling the birds. List of farm equipment, which will be needed, is as under:

Table 6-1 Farm Equipment

Farm Equipment	No.	Rs/unit.	Rs.
Brooder	15	650	9,750
Drum Heater	3	2,500	7,500
Small Drinkers	38	90	3,420
Large Drinkers	112	180	20,160
Small Feeder	38	95	3,610
Large Feeder	112	185	20,720
Shifting Box ³	8	1,800	14,400
Total Machine Cost			79,560

³ Used to shift Day Old Chicks

7 LAND & BUILDING

Table 7-1 Space Requirement

Space Requirement	Required Area (Sq.ft)
Management building	100
Shed Space (1 Sq.ft/bird)	7,500
Store Room	180
Rooms for Guard and Workers	144
Total Project Space Requirement	7,924
Rental Cost/sq.ft (Rs)	2
Total Building Rental Cost (Rs) per month	15,848

7.1 Recommended Mode for Acquiring Land

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

Rental cost of Rs 2/sq.ft⁴ per month prevails in the market. Advance rent for one year is paid.

7.2 Suitable Locations

Suburban and rural areas around the major cities of the country are the suitable areas for setting up a poultry farm. Setting up a farm at an isolated place will minimize the risk of disease.

Proximity of the farm to the city enables the farmer to have a quick communication with the market for the purchase of Day Old Chicks, farm inputs (feed, etc.), and selling of mature birds.

7.3 Infrastructure Requirement

Poultry's farming needs to be handled tactically, right from the selection of the site to the final stage when the birds are sold. The farm should be located at a place where transportation of birds and feed can be handled easily.

The entrepreneur should make sure that the following things are available at the farm site before setting up the farm:

- Electricity connection
- Drinking quality water

⁴ Includes the cost of electronic fixtures, nylon sheets and other farm infrastructure apart from farm equipment, since this usually built-in in any existing poultry farm.

8 PROJECT COST

Table 8-1 Project Economics

Account Head	Total Cost (Rs)
Machinery & Equipment	79,560
Furniture and Fixture	18000
Office Equipment	35000
Pre operating cost	42000
Total Capital Cost	174,560
Raw material inventory	517,500
Upfront Building Rent	190,176
Cash in hand	150,000
Total Working Capital	857,676
Total Project Cost (Rs)	1,032,236

Table 8-2 Project Return

	Project
IRR	46%
Payback Period (years)	3.86
NPV (Rs)	3,278,871

Table 8-3 Financing Plan

Financing		Rs.
Equity	50%	516,118
Debt	50%	516,118

9 KEY SUCCESS FACTORS

• Farm Management

Proper technical supervision of the enterprise is the key to the success of a broiler farm. Farm employees should be aware of the feeding and drinking habits of birds. The farm supervisor should be vigilant and should ensure timely feeding and vaccination, so that the birds stay healthy and disease-free.

Critical Management Factors

1. Temperature -- should be kept at optimum level regardless of age of birds or season. Your system should be able to respond to changing weather conditions night and day

2. Ventilation -- replaces oxygen used by birds, removes moisture and ammonia and must be continually monitored.
3. Feed and water -- Keep plentiful and clean according to production program.
4. Husbandry -- study the flock daily for signs of discomfort, disease, proper feed and water consumption. With experience, you should be able to look at the birds and determine if they have a problem.
5. Understand that you are working with a live animal that may have special needs.
6. Culling sick chickens is a key part of the job.

- **Market Information**

The entrepreneur should be well aware of the supply and demand of chicken in the city. This will help the entrepreneur to negotiate well the sale price of birds. The price of chicken meat fluctuates tremendously during a year.

- **Mortality Losses**

Mortality can only be controlled if the farm conditions are hygienic. Mortality losses should be kept below 8% by timely vaccination & medication.

10 THREATS

The poultry industry has some inherent issues, which can not be controlled by an individual entrepreneur. Following are some threats faced by this industry: -

- **Disease Epidemic**

Diseases like *New Castle* are extremely dangerous. They can eradicate the entire bird population, so the birds need to be protected against such type of diseases, by proper vaccination and medication.

- **Fluctuations in Production Cost**

One of the major problems faced by poultry industry is the variation of feeding cost, which has a huge impact on the overall production costs. If the production costs moves too high it results in huge decline in demand of poultry meat consequently the poultry farmers have to operate on very low profit margins.

FINANCIAL ANALYSIS

10.1 Project Cost

Capital Investment	Rs. in actuals
Land	-
Building/Infrastructure	-
Machinery & equipment	79,560
Furniture & fixtures	18,000
Office vehicles	-
Office equipment	35,000
Pre-operating costs	42,000
Training costs	-
Total Capital Costs	174,560

Working Capital	Rs. in actuals
Equipment spare part inventory	-
Raw material inventory	517,500
Upfront land lease rental	-
Upfront building rent	190,176
Upfront machinery & equipment lease rental *	-
Upfront office equipment lease rental *	-
Upfront office vehicles lease rental *	-
Upfront insurance payment	-
Cash	150,000
Total Working Capital	857,676

Total Investment	1,032,236
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Initial Financing	Rs. in actuals
Debt	516,118
Equity	516,118
Lease	-
Export re-finance facility	-

10.2 Projected Income Statement

Statement Summaries										Broiler Farm (7500 Birds)
Income Statement										
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
	Rs. in actuals									
Revenue	7,200,000	7,920,000	8,712,000	9,583,200	10,541,520	11,595,672	12,755,239	14,030,763	15,433,839	16,977,223
Cost of goods sold	6,690,000	7,167,570	7,679,497	8,228,278	8,816,596	9,447,330	10,123,573	10,848,645	11,626,115	12,459,814
Gross Profit	510,000	752,430	1,032,503	1,354,922	1,724,924	2,148,342	2,631,666	3,182,118	3,807,724	4,517,409
<i>General administration & selling expenses</i>										
Rental expense	190,176	205,390	221,821	239,567	258,732	279,431	301,785	325,928	352,003	380,163
Utilities expense	9,501	10,451	11,497	12,646	13,911	15,302	16,832	18,515	20,367	22,404
Professional fees (legal, audit, etc.)	3,600	3,960	4,356	4,792	5,271	5,798	6,378	7,015	7,717	8,489
Depreciation expense	13,256	13,256	13,256	13,256	13,256	13,256	13,256	13,256	13,256	13,256
Amortization expense	8,400	8,400	8,400	8,400	8,400	-	-	-	-	-
Mortality	267,600	286,703	307,180	329,131	352,664	377,893	404,943	433,946	465,045	498,393
Subtotal	492,533	528,160	566,510	607,792	652,234	691,680	743,194	798,661	858,387	922,703
Operating Income	17,467	224,270	465,993	747,130	1,072,690	1,456,662	1,888,472	2,383,457	2,949,338	3,594,706
Earnings Before Interest & Taxes	17,467	224,270	465,993	747,130	1,072,690	1,456,662	1,888,472	2,383,457	2,949,338	3,594,706
Interest expense	68,409	71,339	55,807	37,423	15,663	758	-	-	-	-
Earnings Before Tax	(50,942)	152,931	410,186	709,706	1,057,027	1,455,904	1,888,472	2,383,457	2,949,338	3,594,706
Tax	-	-	-	-	-	-	-	-	-	-
NET PROFIT/(LOSS) AFTER TAX	(50,942)	152,931	410,186	709,706	1,057,027	1,455,904	1,888,472	2,383,457	2,949,338	3,594,706
Balance brought forward		(50,942)	101,989	512,175	1,221,881	2,278,908	3,734,812	5,623,284	8,006,742	10,956,079
Total profit available for appropriation	(50,942)	101,989	512,175	1,221,881	2,278,908	3,734,812	5,623,284	8,006,742	10,956,079	14,550,785
Balance carried forward	(50,942)	101,989	512,175	1,221,881	2,278,908	3,734,812	5,623,284	8,006,742	10,956,079	14,550,785

10.3 Projected Cash-flow Statement

Statement Summaries											Broiler Farm (7500 Birds)
Cash Flow Statement											Rs. in actuals
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
<i>Operating activities</i>											
Net profit	-	(50,942)	152,931	410,186	709,706	1,057,027	1,455,904	1,888,472	2,383,457	2,949,338	3,594,706
Add: depreciation expense	-	13,256	13,256	13,256	13,256	13,256	13,256	13,256	13,256	13,256	13,256
amortization expense	-	8,400	8,400	8,400	8,400	8,400	-	-	-	-	-
Accounts receivable	-	(591,781)	(29,589)	(62,137)	(68,351)	(75,186)	(82,704)	(90,975)	(100,072)	(110,079)	(121,087)
Raw material inventory	(517,500)	(74,986)	(85,851)	(98,291)	(112,533)	(128,839)	(147,508)	(168,882)	(193,353)	(221,370)	1,749,115
Pre-paid building rent	(15,848)	(1,268)	(1,369)	(1,479)	(1,597)	(1,725)	(1,863)	(2,012)	(2,173)	(2,347)	31,680
Accounts payable	-	570,204	43,562	47,140	51,044	55,310	59,975	65,082	70,677	76,815	(81,040)
Cash provided by operations	(533,348)	(127,116)	101,339	317,075	599,925	928,243	1,297,060	1,704,941	2,171,792	2,705,612	5,186,630
<i>Financing activities</i>											
Change in long term debt	516,118	(59,484)	(84,566)	(100,097)	(118,481)	(140,242)	(13,248)	-	-	-	-
Issuance of shares	516,118	-	-	-	-	-	-	-	-	-	-
Cash provided by / (used for) financing :	1,032,236	(59,484)	(84,566)	(100,097)	(118,481)	(140,242)	(13,248)	-	-	-	-
<i>Investing activities</i>											
Capital expenditure	(174,560)	-	-	-	-	-	-	-	-	-	-
Cash (used for) / provided by investing :	(174,560)	-	-	-	-	-	-	-	-	-	-
NET CASH	324,328	(186,600)	16,773	216,977	481,444	788,002	1,283,812	1,704,941	2,171,792	2,705,612	5,186,630
Cash balance brought forward		324,328	137,728	154,501	371,479	852,923	1,640,924	2,924,736	4,629,677	6,801,469	9,507,081
Cash available for appropriation	324,328	137,728	154,501	371,479	852,923	1,640,924	2,924,736	4,629,677	6,801,469	9,507,081	14,693,710
Cash carried forward	324,328	137,728	154,501	371,479	852,923	1,640,924	2,924,736	4,629,677	6,801,469	9,507,081	14,693,710

11 KEY ASSUMPTIONS

Table 12-1: Production Assumptions

Maximum Capacity Utilization	100%
Number of Birds per Flock	7,500
Number of Flocks per Year	6
Mortality Rate	8%
Annual Production (birds)	45,000
Time required per Flock (days)	42
Lag time between the Flock (weeks)	2
Average weight per bird (kg)	1.6

Table 12-2: Economy Related Assumptions

Electricity growth rate	10%
Wage growth rate	10%

Table 12-3: Revenue Assumptions

Sales price(in Rs/kg)	100
Sales price growth rate	10%

Table 12-4: Expense Assumptions

DOC (Day Old Chicks) in Rs	48
COGS growth rate	7%
Average Feed Requirement/bird/day (kg)	0.08
Cost of feed (in Rs/kg)	25
Vaccination Cost per bird	3
Litter Cost per flock	6,000

Table 12-5: Cashflow Assumptions

Raw Material Inventory (Month's production)	1
Accounts Receivable Cycle(Days)	30
Accounts Payable Cycle(Days)	30

Table 12-6: Financial Assumptions

Project life (Years)	10
Debt - Equity	50%-50%
Interest rate on long-term debt	17%
Interest rate on short term debt	17%
Debt tenure (Years)	5
Debt payments per year	1