Poultry Farming
Controlled Environment
(35,000 Birds)

R & D and Training Wing

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Summary

Poultry is one the most important sector of agriculture industry in Pakistan by providing employment to 1.5 million people. Broiler meat is the cheapest source of animal protein available in Pakistan by contributing 4.81% in agriculture growth and 9.84% in Livestock growth. According to Industry sources there is capacity of 5,000 Environmental Control Houses in Pakistan and currently 2,500 houses are working, out of which 75% (1,875) are in Punjab and remaining 25% (625) are in other provinces.

In environmentally Controlled Poultry Farm the day old chicks (DOCs) are raised on rich protein feed for about a period of six weeks. Approximately, six flocks of birds could be reared on the same premises of the farm. The Controlled Shed Poultry Farm with population of 35,000 birds presently needs a capital investment estimated at Rs. 19.2 million for construction, purchasing machinery and equipment. In addition to this, a sum of Rs. 5.7 million is required as working capital, which would be used for purchasing day old chicks and other inputs like feed, vaccines, etc. The total project cost is estimated at Rs. 24.9 million. The estimated income varies from 1.9 million to 10 million per annum from first to tenth year of the project. This is a profitable business enterprise due to continuous increasing demand of the white meat in the market and export prospects especially in Muslim countries.

1. Introduction

Poultry sector is one of the effervescent segments of Agriculture Industry in Pakistan. This sector generates employment and income for about 1.5 million people. Its contribution in agriculture growth is 4.81% and in Livestock growth 9.84%. Poultry meat contributes 19% of the total meat production in the country. * The current investment on poultry industry is above Rs. 200 billion. Poultry sector has shown a robust growth at the rate of 8-10% annually which reflects its inherent potential. Share of poultry meat in beef and mutton and production of commercial and rural poultry for the last three years are given below in Table I & 2, respectively.

Table No. 1 Meat Production (000 tons):

Meat	2006-07	2007-08	2008-09
Beef	1498	1549	1601
Mutton	566	578	590
Poultry Meat	554	601	652
Total	**2618**	**2728**	**2843**

Table No. 2 Domestic/Rural & Commercial Poultry: **

Type Units		**2006-07**	**2007-08**	**2008-09**
Domestic Poultry	Million No	74.02	75.11	76.22
Cocks	"	8.84	9.08	9.32
Hens	"	34.84	35.47	36.11
Chicken	"	30.34	30.57	30.79
Eggs	"	3484	3547	3611
Meat	000 Tons	96.54	98.45	100.41
Duck, Drake & Ducking	Million No	0.67	0.64	0.61
Eggs	"	29.85	28.61	27.42
Meat	000 Tons	0.91	0.87	0.83
Commercial Poultry				
Layers	Million No	24.82	26.56	28.42
Briolers	"	370.70	407.77	448.55
Breeding Sock	"	7.25	7.61	7.99
Day Old Chciks	"	387.20	425.92	468.51
Eggs	"	6682	7136	7620
Meat	000 Tons	456.95	501.3	550
Total Poultry				
Day Old Chicks	Million No	418	456	499
Poultry Birds	"	477	518	562
Eggs	"	10197	10711	11258
Poultry Meat	000 Tons	554	601	652

* Economic Survey of Pakistan 2008-09 (Chapter No. 2 Page No.34)

**Economic Survey of Pakistan 2008-09

The daily availability of protein quantity per capita in Pakistan amounts to 13.6 gram, deriving from animal source including beef, mutton, poultry and fish. According to the World Health Organization standards the required daily dietary protein allowance from animal source is 27 grams whereas we have much less than this. In our Country per capita consumption of meat is only 5 kg and 40-45 eggs annually whereas developed countries are consuming 41 kg meat and over 300 Eggs per capita per year (Pakistan Poultry Association; www.ppapaknorthern.com).

In Pakistan the consumption of white meat has gradually increased in recent years due to growing health awareness in masses. The cheapest source of animal protein available in Pakistan is broiler meat. Broiler birds are reared in lesser time than any other source of animal protein. Day Old Chicks (DOCs) are raised on high protein feed for about six weeks in Controlled Environment. The increasing demand of white meat in market has made it a profitable business enterprise. Approximately, six flocks of birds could be reared on the same premises of the farm. DOCs are purchased from private hatcheries and mature in brooding, on rice-husk or saw-dust providing specific requirement during first four weeks and then grown-up for grand growth since sixth week to attain about two kg weight. In controlled environment the temperature, feed and drinking system is operated automatically and monitored by the trained staff. The broiler house is given 15 days for the preparation to receive the new flock after marketing of broiler about at age of six weeks. Prior to the arrival of the new flock proper cleaning, washing, white washing, disinfections and fumigation is performed with recommended chemicals. During flock, strict measures for bio-security are observed at the unit.

A According to Industry sources there is capacity of 5,000 Environmental Control Houses in Pakistan and currently 2,500 houses are working, out of which 75% (1,875) are in Punjab and remaining 25% (625) are in other provinces.

2. Project Cost

The Controlled Shed Poultry Farm with population of 35,000 birds needs a capital investment estimated at Rs. 19.2 million for construction, purchasing machinery and equipment. In addition to this, a sum of Rs. 5.7 million is required as working capital, which would be used for purchasing day old chicks and other inputs like feed, vaccines, etc. The total project cost is estimated at Rs. 24.9 million.

3. Present Poultry Industry Scenario

Grand Parents are imported from Australia, Holland, Germany and USA. These Grand Parents produce Breeders that produce final products which are Broilers, so the generation line of broiler comes from pure line (Strains) i.e. Great Grand Parents. The day old broilers are purchased from hatcheries.

Broilers are fed with high nutrition feed mix produced by feed mills. Poultry feed consists of rich protein elements like canola meal, rapeseed meal, sunflower meal,

soyabean meal, feather meal and rich energy elements like grains, gluten, etc. The major component of cost of production of chicken meat accounts for feed cost.

Sector Information

Total Investment	Rs. 200 Billion
No. of Hatcheries	400
No of Feed Mills	150
Grand Parents	200,000
Parents	6 Million
Broiler	600 Million
Poultry Meat	621,000 Metric Ton

Pakistan Poultry Association (www.ppapaknorthern.com)

4. Effects of Environment on Poultry Farming

Heat stress is the major problem in poultry farming. Being a tropical country the temperature reaches over 40°C during summer and is not suitable for poultry farming. Hot and humid weather conditions and poor management practices increase the mortality in flocks, reduce the growth and make poultry production to uneconomical level. In traditional farming, during the summer farmers have to either continue taking flocks compromising with poor performance in feed intake, growth rate, weight gain, FCR (Feed Conversion Ratio) in broilers along with mortality or totally close the business to avoid all these risks that could disturb the hired labour and staff.

Controlled environment poultry farms can overcome this critical summer situation. These farms when equipped with highly mechanized system of automatic chain feeding and nipple drinking systems make the environment quite conducive for poultry production by getting continuous production.

5. Benefits of Poultry Farming in Controlled Environment

Poultry Farming in Controlled Environment has brought a great change in poultry industry of Pakistan and is rapidly becoming popular among broiler producers due to its following significant advantages:

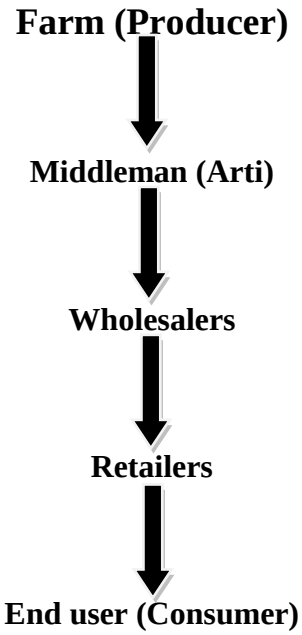
1. The temperature remains consistent round the clock providing very conducive environment to the broilers.
2. The temperature can be brought down by 10°C to 15°C in controlled environment farm as compared to the conventional farm and makes environment more comfortable for birds.

3. In conventional farming the broiler production in summer is almost stopped and only four flocks could be taken whereas in controlled environment farming 6-7 flocks could be raised.

4. Being controlled environment the incidence of diseases could be minimized and cut down the cost of vaccine and medication of Rs. 2-3 per bird as compared to conventional farming.
5. Mortality has been decreased to 2 to 3 percent in controlled environment farm as compared to 10 percent in conventional farm.
6. In controlled environment farm only one person at daytime and one at night time are sufficient to look after a flock of 35,000 birds. Whereas conventional farm nearly 6-8 persons are required to manage such a flock.
7. In controlled environment farm a broiler flock is ready for market in 37 days as compared to 45 days in conventional farm.
8. Feed Conversion Ratio (FCR) in conventional farm is more 2 to 2.2 (3 to 3.3 kg feed to gain 1.5 kg weight), whereas FCR is improved to 1.8 in controlled environment farm (2.8 kg feed to gain 1.5 kg weight).

6. Marketing Channels

The marketing channel of broilers is as follows



The role of middleman (Arti) is to identify a farm and negotiate the price. In some cases he 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.

7. Farm Requirements and Management

In Controlled Environment Farm, inputs including farm equipments like drinkers, feed trays, brooders, and feeders and other items like feed, vaccines & medicines, rice-husk or saw-dust, water and electricity etc are required. To achieve good production following

practices should be performed under the supervision of an expert starting from arrival of the chicks to marketing of broilers.

1. Diesel heaters can control the low temperature. The high temperature should be controlled with evaporative cooling system.
2. Automatic nipple drinking system.
3. Automatic feeding system.
4. Diseases can be controlled by scheduled vaccination and medication.
6. Sanitation and disinfections program should be strictly followed during and after the completion of one flock.
7. Feed intake, body weight, FCR and mortality should be recorded carefully.
8. Proper channels are recommended for Marketing of final products (broilers).

8. Production Assumptions

Assumptions used for the product mix are as follows:

Product	**Avg. Live Weight (kg)**	**Price per kg**
Chicken	1.85	Rs. 110

Number of Flocks per year	6
Number of Birds per Flock	35,000
Time required per Flock (Days)	40
Lag time required per Flock (Days)	15
Total Annual Production Capacity	210,000
Shed Space Required per Bird (sq. ft)	0.65
Sale price growth rate (%)	10
Production capacity utilization (%)	100

9. Human Recourse Requirements

To look after the feeding, vaccination and cleaning operations at the farm skilled worker required. Following manpower is required for a farm of 35,000 birds.

Description	**No.**	**Salary Per Month (Rs)**	**Salary for the Year (Rs)**
Supervisor	1	10,000	120,000
Housemen	2	11,000	132,000
Electrician	1	8,000	96,000
Watchmen	2	11,000	132,000
Cleaner	1	5,500	66,000
Total	**7**	**45,500**	**546,000**

10. Equipments and Machinery Requirements

The present information and rates were recorded during the visit to M/S SS Traders Poultry Farms Raiwind Distt. Kasur. List of farm equipments, which should be needed, is as under:

10.1. Main Feed Line System

Description	Spec.	Quantity
Drive System		1
Feed Sensor		1
Strobe with three open	75	4
Main feed line	90mm	18
Base Hopper	800kg	1
Hopper base part	75mm	1
Accessories		1

10.2. Feed Pan System

Description	Spec.	Quantity
Drive System (Taiwan Motor)	0.75 kw	3
Controlling Pan		3
Delivery Pan	4holes/3m/unit	135
Feed Pan		540
Winch		3
Hang pieces (with 8' distance)		3
Anti-roost wire		3
Winch Shake	DMR 550	3
Hopper	105 L	3
Steel Wire	φ5.0mm	550m
Steel Wire	φ1.5mm	500m

10.3. Nipple Drinking System

Description	Spec.	Quantity
Pressure regulator		4
Connecting tube		4
Nipple Drinking System	15 nipples/3m/unit	180
Winch		4
Winch Shakes		4
Hang piece		4
Anti-roost wire		4
Main water inlet system		
Water meter system		
Steel wire	φ3.0mm	500m
Steel wire	φ1.5mm	500m

10.4. Ventilation System

Description	Spec.	Quantity
Fan 50 (Cone Fan)		10
Fan 36 (Box Fan)		3

10.5. Pad Cooling System

Description	Spec.	Quantity
Cooling Pads		70

10.6. Minimum Ventilation System (Air Inlets)

Description	Spec.	Quantity
Air Inlets		100
Connecting Rope & Accessories		2
Side Wall Winches		2

10.7. Motor for Air Intel

Description	Spec.	Quantity
0.75 KW Gear Motor with double direction		1

10.8. Controlling Equipments

Description	Spec.	Quantity
Controlling Agrologic 304 D	16 stages	1
Temperature Sensor		1
Humidity Sensor		1

10.9. Heating System

Description	Spec.	Quantity
VDL P 120 Direct Diesel Fired Heater, 120 KW, 7700 cubic meter per hour		1

11. Summary of Equipment Supply

Description	**Amount Rs.**
Main Feed Line System	85,000
Feed Pan System	524,170
Nipple Drinking System	337,470
Ventilation System (Cone Fans)	308,700
Minimum Ventilation Fan	60,782
Pad Cooling System	142,296
Minimum Ventilation System(Air Inlets with Accessories)	185,304
Motor for Air Intel	26,000
Controlling Equipments	45,000
Heating System	250,000
Total Cost of Machinery	**1,964,722**

Generator Set (75 KVA)	1	750,000
Fire Extinguisher etc. (Set)	1	27,000
Other Equipments (Shovels, Hand Trolley, Uniforms, etc)		30,000
Total Machinery & Equipment Required		2,771,722
Erection & Installation of Machinery	1%	27,717
Contingencies	3%	83,152
Total Machinery & Equipment Required (incl. Erection & Installation etc.)		**2,882,591**

12. Land & Building

12.1. Land Requirement

Land	Per Acre Cost	Total Cost Rs.
1.5 Acre	1,000,000	1,500,000

12.2. Building Requirement

Description	Area (sq.ft.)	Cost (Rs. / sq.ft.)	Total (Rs.)
Shed Space (380ft X 61ft)	23,180	570	13,212,600
Building for Resident & Office Purposes Ground Floor			
Feed Store	500		
Toilet Block	100		
Admin Office	100		
Areas for Corridor	150		
Generator Set Room	400		
Store for Vaccine & Medicines & Misc.	150		
Changing/Store Room for Staff	100		
Rooms for Staff	400		
Kitchen	80		
Total Area	1980	750	1,485,000
Boundary wall 7 feet height			500,000
Total Building & Infrastructure Cost			**14,697,600**

13. Suitable Site for Poultry Farming

The purchased land is recommended for controlled environment poultry farm. Rural areas around the major cities of the country are the suitable areas for setting up a poultry farm. Nearness of the farm to the city make easy access to market for the purchase of Day Old Chicks, farm inputs (feed, etc.), and selling of broilers. All the management functions should be performed tactically, right from the selection of the site to the final stage when the birds are sold. The farmer should make sure the availability of electricity connection and supply and quality of drinking water.

14. Project Detail

Capital Investment	**Rs.**
Land	1,500,000
Building/Infrastructure	14,697,600
Machinery & Equipment	2,882,591
Furniture & Fixture	35,000
Office equipment	30,000
Pre-Operating Costs	80,000
Total Capital Costs	**19,225,191**

Working Capital	**Rs.**
Raw material inventory	5,200,000
Cash	500,000
Total Working Capital	**5,700,000**

Total Investment	**24,925,191**

Initial Financing		**Rs.**
Debt	60%	14,955,115
Equity	40%	9,970,076

15. Projected Income Statement

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Revenue from sale of birds	41,452,950	44,769,186	48,350,721	52,218,779	56,396,281	60,907,983	65,780,622	71,043,072	76,726,517	82,864,639
Sale of Feed Bags		-	-	-	-	-	-	-	-	-
Sale of Rice Husk		-	-	-	-	-	-	-	-	-
Total Revenue	**41,452,950**	44,769,186	48,350,721	52,218,779	56,396,281	60,907,983	65,780,622	71,043,072	76,726,517	82,864,639
Cost of Sales										
Cost of DOC	12,600,000	13,482,000	14,425,740	15,435,542	16,516,030	17,672,152	18,909,202	20,232,847	21,649,146	23,164,586
Cost of Feed	18,000,000	19,260,000	20,608,200	22,050,774	23,594,328	25,245,931	27,013,146	28,904,067	30,927,351	33,092,266
Operations costs (direct labor)	300,000	330,000	363,000	399,300	439,230	483,153	531,468	584,615	643,077	707,384
Vaccination, Medication & Disinfection	1,500,000	1,575,000	1,653,750	1,736,438	1,823,259	1,914,422	2,010,143	2,110,651	2,216,183	2,326,992
Direct Electricity	2,000,000	2,200,000	2,420,000	2,662,000	2,928,200	3,221,020	3,543,122	3,897,434	4,287,178	4,715,895
Diesel for Generator & Heater	1,500,000	1,650,000	1,815,000	1,996,500	2,196,150	2,415,765	2,657,342	2,923,076	3,215,383	3,536,922
Litter & Spray Cost	240,000	252,000	264,600	277,830	291,722	306,308	321,623	337,704	354,589	372,319
Total cost of sales	36,140,000	38,749,000	41,550,290	44,558,383	47,788,919	51,258,751	54,986,047	58,990,393	63,292,907	67,916,364
Gross Profit	**5,312,950**	**6,020,186**	**6,800,431**	**7,660,395**	**8,607,362**	**9,649,232**	**10,794,575**	**12,052,679**	**13,433,610**	**14,948,275**
General Administration & Selling Expenses										
Administration expense	546,000	600,600	660,660	726,726	799,399	879,338	967,272	1,064,000	1,170,399	1,287,439
Administration benefits expense	16,380	18,018	19,820	21,802	23,982	26,380	29,018	31,920	35,112	38,623
Travelling expense	27,300	30,030	33,033	36,336	39,970	43,967	48,364	53,200	58,520	64,372
Communication expense (phone, fax. etc)	16,380	18,018	19,820	21,802	23,982	26,380	29,018	31,920	35,112	38,623
Office expense (stationary etc)	16,380	18,018	19,820	21,802	23,982	26,380	29,018	31,920	35,112	38,623
Professional fees (legal, audit etc.)	20,726	22,799	25,078	27,586	30,345	33,379	36,717	40,389	44,428	48,871
Depreciation expense	1,029,639	1,029,639	1,029,639	1,029,639	1,029,639	1,029,639	1,029,639	1,029,639	1,029,639	1,029,639
Amortization of pre-operating costs	16,000	16,000	16,000	16,000	16,000	-	-	-	-	-
Subtotal	1,688,805	1,753,122	1,823,870	1,901,693	1,987,298	2,065,464	2,169,047	2,282,988	2,408,322	2,546,191
Operating Income	**3,624,145**	**4,267,064**	**4,976,561**	**5,758,702**	**6,620,064**	**7,583,768**	**8,625,528**	**9,769,691**	**11,025,288**	**12,402,084**
Other Income (interest on cash)										
Earnings Before Interest & Tax	**3,624,145**	**4,267,064**	**4,976,561**	**5,758,702**	**6,620,064**	**7,583,768**	**8,625,528**	**9,769,691**	**11,025,288**	**12,402,084**
Interest expense on long term debt (Project Loan)										
Interest expense on long term debt (Working Capital Loan)	1,050,000	955,000	795,000	550,000	350,000	150,000				
Subtotal	1,050,000	955,000	795,000	550,000	350,000	150,000	-	-	-	-
Earnings Before Tax	**2,574,145**	**3,312,064**	**4,181,561**	**5,208,702**	**6,270,064**	**7,433,768**	**8,625,528**	**9,769,691**	**11,025,288**	**12,402,084**
Tax	643,536	828,016	1,045,390	1,302,176	1,567,516	1,858,442	2,156,382	2,442,423	2,756,322	3,100,521
NET PROFIT AFTER TAX	**1,930,609**	**2,484,048**	**3,136,171**	**3,906,527**	**4,702,548**	**5,575,326**	**6,469,146**	**7,327,268**	**8,268,966**	**9,301,563**

16. Input Assumptions

16.1. Net Birds Calculation for Revenue

No. of Birds Per Flock	35,000
Mortality in Birds @ 3% of Total Birds	1,050
Net Birds after Mortality Per Flock	33,950
Net Birds after Mortality for the Year (For Revenue)	203,700

16.2. Net Birds Calculation for Cost of Feed

	No. of Birds	**Amount in Rs.**
Total Mortal Birds	1,050	
During first two weeks Mortal birds @ 50% of Total Mortality	525	17,325
During 3rd and 4th weeks Mortal birds @ 30% of Total Mortality	315	20,790
During 5th and 6th weeks Mortal birds @ 20% of Total Mortality	210	20,790
Cost of Feed Consumed by Mortal Birds Per Flock	1050	58,905
Cost of Feed Consumed by Remaining Birds	33,950	2,983,356
Total Cost of Feed Consumed by the Birds Per Flock		3,042,261
Total Cost of Feed Consumed by the Birds Per Year		18,253,566

16.3. Expense Assumption

Administration benefits expense	3% of administration expense
Traveling expense	5% of administration expense
Communication expense	3% of administration expense
Office expenses (Misc.)	3% of administration expense
Professional fees (legal, audit, consultants, etc.)	0.05% of revenue

16.4. Depreciation Assumption

Depreciation Method	**Straight Line Method**
Building depreciation rate	5%
Machinery & Equipment depreciation rate	10%
Office Equipment depreciation rate	10%
Furniture & Fixtures depreciation rate	10%

16.5. Cost of Goods Sold

Description	**Rs.**
DOC (Day Old Chicks) (Rs.)	60
Feed Conversion Ratio (FCR) i.e. Feed required to gain 1 kg weight (kgs.)	1.90
Feed required per 1000 birds - (50 kgs bags)	70.3
Feed Requirement/bird/day - kgs	0.10
Vaccination. Medication and Disinfection Cost per Bird (Rs.)	9
Feed Price per Bag (50 kgs)	1,250
Cost of Feed per kg – Rs.	25

16.6. Growth Rate Description

Sales Growth Rate (%)	08
CGS Growth Rate (DOC, Vaccine & Medication, Litter & Spray) (%)	08
Cost of Feed Growth Rate (%)	07
Salaries Growth Rate (%)	10
Electricity & Diesel Growth Rate (%)	10

17. Disclaimer

The content of the information memorandum does not bind NBP in any legal or other form as the purpose of this report is to provide a general idea and information to NBP staff to assist them evaluate the feasibility reports submitted by the clients, and for the farmers and organizations interested to establish environmental controlled poultry sheds. The data and info reported in this document is gathered from various sources and is based on certain assumptions. In spite of taking due diligence in compiling this report, the contained information may vary due to any change in any of the relevant factors e.g. cost of machinery, feed, day old chicks and market price of the produce and the actual results may differ substantially from the presented information. NBP does not assume any liability for any financial or other loss resulting from this document in consequence of undertaking this Project.