

PROFILE ON CHICKEN DRESSING

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II. SUMMARY

This profile envisages the establishment of a plant for the production of dressed chicken with a capacity of 1,500 tonnes per annum.

The principal raw materials required are birds/chickens of about 1.5 kg weight, which can be obtained locally.

Dressed chicken has a high domestic demand by hotels, restaurants, super markets, and various institutions with food catering services, and households. The present demand for the proposed product is estimated at 1,700 tonnes per annum. The demand is expected to reach at 2,465 tonnes by the year 2020.

The total investment requirement is estimated at Birr 25.85 million, out of which Birr 12.5 million is required for plant and machinery. The plant will create employment opportunities for 37 persons.

The project is financially viable with an internal rate of return (IRR) of 18.90 % and a net present value (NPV) of Birr 10.82 million, discounted at 8.5%.

This project will have a backward linkage effect with the livestock sub sector.

II. PRODUCT DESCRIPTION AND APPLICATION

Chickens belong to the general group of poultry which are domesticated birds that serve as a source of eggs or meat and that include, among commercially important kinds, such as turkeys, ducks, geese, guinea fowls, pigeons and others.

A chicken or other bird, especially a chicken at the age of 10-12 weeks and weighing up to 1.5 kg, which is dressed and fit for broiling, is termed as broiler. Dressed and packed chickens are broilers killed, bled, and more or less completely prepared for cooking.

The major consumers of the product of the envisaged plant will be hotels, restaurants, super markets, various institutions with food catering services, and high income households.

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

1. Past Supply and Present Demand

In general, poultry refers to domesticated birds that serve as a source of eggs or meat, including chicken, turkeys, ducks, geese, guinea fowls, pigeons and others. However, chicken meat accounts for the overwhelming proportion of the poultry meat consumed in Ethiopia.

According to the unpublished data of the City Administration's Urban Agriculture Department, the per capita consumption in Addis Ababa was about 2.5 kg of poultry meat. Accordingly, considering the total population size of Addis Ababa in 2008, which is 3.4 million the total consumption of the product is estimated at 8,500 tonnes.

Industrially processed poultry meat has a high domestic demand by hotels, restaurants, super markets, various institutions with food catering services, and high income urban households. Therefore, the demand for processed poultry meat is conservatively estimated at 20% of the total demand for poultry meat. Accordingly, the present demand for processed poultry meat in Addis Ababa is estimated at 1,700 tonnes.

2. Projected Demand

Given a high domestic demand for processed poultry meat by hotels, restaurants, super markets, various institutions with food catering services, and urban households, a 2.9% rate of growth is used which is equivalent to the growth of population. Table 3.1 depicts the projected demand for the product.

Table 3.1

PROJECTED DEMAND FOR PROCESSED POULTRY MEAT (in tonnes)

Year	Projected Demand
2008	1749
2009	1800
2010	1852
2011	1906
2012	1961
2013	2018
2014	2077
2015	2137
2016	2199
2017	2263
2018	2328
2019	2396
2020	2465

3. Pricing and Distribution

Currently, the retail price of processed chicken meat is Birr 45 per kg. Allowing margin for wholesale and retail the factory gate price for the product of the envisaged plant is estimated at Birr 40 per kg.

The envisaged plant can distribute its product through the existing wholesale and retail network, which includes department stores, merchandise shops and super markets.

B. PLANT CAPACITY AND PRODUCTION PROGRAMME

1. Plant Capacity

The designed annual capacity of the plant will be 1,500 tonnes of dressed and packed chickens of about 1.125 kg, each. The production capacity is based on single shift of 8 hours per day and 300 days per year operation of the plant.

2. Production Programme

The plant will operate at 70% of its rated capacity in the first year and 90% in the second year. Full production capacity will be achieved in the third year and thereafter. Low operation capacity has been set for the first and second year due to the time needed for market penetration. Detailed production programme is shown in Table 3.3 below.

Table 3.3
PRODUCTION PROGRAMME

Year	1	2	3-10
Capacity utilization (%)	70	90	100
Production (tonnes)	1,050	1,350	1,500

IV. MATERIALS AND INPUTS

A. RAW AND AUXILIARY MATERIALS

The principal raw and auxiliary materials required are birds (chickens of about 1.5 kg each), polyethylene bags and cardboard boxes. Chickens required by the plant can be acquired locally from poultry development centers like ELFORA while Packing materials can be sourced from locally available packing material producers like Classic packing PLC. The detailed annual requirement for raw and auxiliary materials and corresponding

estimated cost at 100% capacity utilization are given in Table 4.1. The total annual cost of raw materials is estimated at Birr 54,993 thousands.

Table 4.1
ANNUAL REQUIREMENT AND COST ESTIMATES OF RAW AND
AUXILIARY MATERIALS

Sr. No.	Description	Unit of Measure	Qty.	Cost '000 Birr
1	Chickens (1.5 kg each)	No.	1,334,000	53,360
2	Polyethylene bags	kg	1,500,000	750
3	Polyethylene bags (edible entrails)	pcs	266,800	133.4
4	Card box	pcs	150,000	750
	Grand Total	-	-	54,993

B. UTILITIES

The major utilities required by the envisaged project are: fuel oil to generate steam, process water, electric power and refrigerant. The total yearly consumption of utilities at 100% capacity utilization rate and their estimated costs are given in Table 4.2. The total utilities cost is estimated at Birr 2,052,450.

Table 4.2
ANNUAL UTILITIES REQUIREMENT AND ESTIMATED COST

Sr. No.	Description	Unit of Measurement	Qty.	Cost (in Birr)	
				Unit Cost	Total Cost
1	Fuel oil	m ³	300	5840	1,752,000
2	Process water	m ³	70,000	3.25	227,500
3	Electric power	kWh	150,000	0.473	70,950
4	Refrigerant	kg	400	5	2,000
	Grand Total	-	-	-	2,052,450

V. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Production Process

The main production processes are described here under:

Slaughtering

- At the processing plant, workers take the birds from their boxes and hang them by their feet on a conveyor belt. In a typical process, the birds on the conveyor are first passed through a vat of electrified salt water called a stun cabinet. About 20 birds occupy the stun cabinet at one time, and they remain in the water for about seven seconds. The mild electrical current in the water stuns or paralyzes the birds. Next, the birds are conveyed to an automatic neck cutter—rotating blades that sever the two carotid arteries. The birds' carcasses hang until all the blood has drained.

Defeathering and evisceration

- The carcasses are then briefly immersed in hot water to scald the skins. This makes removal of the feathers easier. The carcasses move to automatic feather pickers, which are moving rubber fingers that rub off most of the feathers. Then the carcasses are scalded a second time and run through another feather picker. Lastly, a specialized machine removes the wing feathers. The defeathered carcasses next pass to a washer, which scrubs the outside of the body. The feet and head are cut off, and the carcass is conveyed to the evisceration area. Next, the carcass is suspended in shackles by the feet and neck, cut open, and the viscera (internal organs) are removed. When the carcass is empty, it is washed again inside and out by a multiple-nozzled sprayer.

Chilling and Cutting

- The cleaned carcasses are sent down a / chute and immersed in a "chiller" of cooled, chlorinated water for 40-50 minutes. The entire slaughter process takes only about an hour, and the bulk of that time is taken up by the chilling. The internal temperature of the chicken must be brought down to 40° F (4.4° C) or lower before further processing. The chilled carcasses are then passed to a cutting room, where workers cut them into parts, unless they are to be packaged whole. Some carcasses may be cooked and the cooked meat removed and diced for foods such as chicken pot pie or soups. Meat from backs, necks, and wings may be processed separately for sale in other meat products such as hot dogs or cold cuts. In whatever format, the meat is packaged by workers at the processing plant, loaded into cases, and stored in a temperature-controlled warehouse. The waste water to be generated in the production process of dressed chicken will be treated and discharged in the waste water treatment plant.

2. Source of Technology

Equipment for production of dressed and packed chicken can be acquired from Italy, Japan, India, etc. through contacts with the commercial attaches of respective embassies to Ethiopia. The following firms can be considered as one of the possible source of technology:

1. Dah Chong Hong (Japan) Ltd.
(K.K.Taisha) Bouekou (10). 18-2, Roppongi 5- Chome, Minato - Ku, 106-0032
Tel. 03-3582-0706
Fax: 03-3586-8393, 03-3582-7148.
2. Sri Balaji Mill Stores 166, R. P. Road, Secunderabad, Andhra Pradesh, India
P.o box: 500003
Telephone: 91-40-27543327
Mobile Phone: 919391385637
Fax: 91-40-27542279

B. ENGINEERING

1. Machinery and Equipment

The list of required plant machinery and equipment is given in Table 5.1. The cost of machinery and equipment is estimated at Birr12.5 million, of which Birr 10.625 million is required in foreign currency.

Table 5.1

LIST OF MACHINERY AND EQUIPMENT REQUIRED

Sr. No	Description	Qty. (No.)	COST('000)		
			LC	FC	TC
1	Boiler	1	159.37	903.12	1,062.5.
2	Compressor	1	150.0	850.0	1,000.0
3	Water treatment set	1	159.37	903.12	1,062.50
4	Conveyor	1	140.62	796.87	937.50
5	Feather removing equipment	2	131.25	743.75	875.0
6	Vacuum lung aspirator	1	93.75	531.25	625.0
7	Cooling water tank	1	56.25	318.75	375.0
8	Automatic weighing scale	1	75.0	425.0	500.0
9	Freezing room	1	281.25	1593.75	1,875.0
10	Autoclave	1	84.37	478.12	562.5
11	Digester	1	112.50	637.50	750.0
12	Silo	1	93.75	531.25	625.0
13	Edible entrails line	1	337.50	1912.50	2,250.0
	Total		1,875.0	10,625.0	12,500.0

2. Land, Building and Civil Works

The total area of land required for the plant is about 800 square meters. The total built-up area will be 500 square meters and the estimated cost of building assuming building constructed with EGA sheet roof, HCB wall and cement tile floor, at the rate of Birr 2500per m², will amount to Birr 1,250,000. The production hall will cover 350m² areas, the cold room storage 60m² and the office will cover 90m².

According to the Federal Legislation on the Lease Holding of Urban Land (Proclamation No 272/2002) in principle, urban land permit by lease is on auction or negotiation basis. However, the time and condition of applying the proclamation shall be determined by the concerned regional or city government depending on the level of development.

The legislation has also set the maximum on lease period and the payment of lease prices. The lease period ranges from 99 years for education, cultural research, health, sport, NGO, religious and residential area to 80 years for industry and 70 years for trade while the lease payment period ranges from 10 years to 60 years based on the towns' grade and type of investment.

Moreover, advance payment of lease based on the type of investment ranges from 5% to 10%. The lease price is payable after the grace period annually. Those that pay the entire amount of the lease will receive 0.5% discount from the total lease value and those that pay in installments will be charged interest based on the prevailing interest rate of banks. Moreover, based on the type of investment, two to seven years grace period shall also be provided.

However, the Federal Legislation on the Lease Holding of Urban Land apart from setting the maximum has conferred on regional and city governments the power to issue regulations on the exact terms based on the development level of each region.

In Addis Ababa the City's Land Administration and Development Authority is directly responsible in dealing with matters concerning land. However, regarding the manufacturing sector, industrial zone preparation is one of the strategic intervention measures adopted by the City Administration for the promotion of the sector and all manufacturing projects are assumed to be located in the developed industrial zones.

Regarding land allocation of industrial zones if the land requirement of the project is below 5000 m², the land lease request is evaluated and decided upon by the Industrial Zone Development and Coordination Committee of the City's Investment Authority.

However, if the land request is above 5,000 m² the request is evaluated by the City's Investment Authority and passed with recommendation to the Land Development and Administration Authority for decision, while the lease price is the same for both cases.

The land lease price in the industrial zones varies from one place to the other. For example, a land was allocated with a lease price of Birr 284 /m² in Akakai-Kalti and Birr 341/ m² in Lebu and recently the city's Investment Agency has proposed a lease price of Birr 346 per m² for all industrial zones.

Accordingly, in order to estimate the land lease cost of the project profiles it is assumed that all manufacturing projects will be located in the industrial zones. Therefore, for the this profile since it is a manufacturing project a land lease rate of Birr 346 per m² is adopted.

On the other hand, some of the investment incentives arranged by the Addis Ababa City Administration on lease payment for industrial projects are granting longer grace period and extending the lease payment period. The criteria are creation of job opportunity, foreign exchange saving, investment capital and land utilization tendency etc. Accordingly, Table 5.2 shows incentives for lease payment.

Table 5.2

INCENTIVES FOR LEASE PAYMENT OF INDUSTRIAL PROJECTS

Scored point	Grace period	Payment Completion Period	Down Payment
Above 75%	5 Years	30 Years	10%
From 50 - 75%	5 Years	28 Years	10%
From 25 - 49%	4 Years	25 Years	10%

For the purpose of this project profile the average i.e. five years grace period, 28 years payment completion period and 10% down payment is used. The period of lease for industry is 60 years .

Accordingly, the total lease cost, for a period of 60 years with cost of Birr 346 per m², is estimated at Birr 16.61 million, of which 10% or Birr 1,660,800 will be paid in advance. The remaining Birr 14.95 million will be paid in equal installments within 28 years, i.e., Birr 533,829 annually.

VI. MANPOWER AND TRAINING REQUIREMENT

A. MANPOWER REQUIREMENT

The total manpower required is 37 persons. The total annual cost of man power is estimated at Birr 426,750. Details of manpower and annual estimated labour cost including the fringe benefits are given in Table 6.1.

Table 6.1
MANPOWER REQUIREMENT AND ESTIMATED LABOUR COST

Sr. No.	Description	No. of Persons	Salary, Birr	
			Monthly	Annual
1.	Manager	1	3,500	4,2000
2.	Secretary	1	900	10,800
3.	Production and Technical Head	1	2,800	33,600
4.	Quality Controller (chemist)	1	1200	14,400
5.	Operator	8	4800	57,600
6.	Laborer	10	3500	42,000
7.	Mechanic	1	600	7,200
8.	Electrician	1	600	7,200
9.	Finance and Administration Head	1	2,800	33,600
10.	Accountant	1	1,200	14,400
11.	Personnel	1	1,200	14,400
12.	Cashier	1	600	7,200
13.	Sales man	1	1,200	14,400
14.	Purchaser	1	1,200	14,400
15.	Driver	2	450	5,400
16.	Guard	4	1400	16,800
17.	Store-keeper	1	500	6,000
	Total	37		341,400
	Employees' benefit (20% of basic salary)			85,350
	Grand Total	37		426,750

B. TRAINING REQUIREMENT

The quality controller, production and technic manager, mechanic, electrician and eight operators need a two months on-the-job training by the skilled technician of the equipment supplier during erection and commissioning period. The total training cost is estimated at Birr 50,000.

VII. FINANCIAL ANALYSIS

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

Construction period	1 year
Source of finance	30 % equity 70 % loan
Tax holidays	3 years
Bank interest	8.5%
Discount cash flow	8.5%
Accounts receivable	30 days
Raw material local	7 days
Raw material import	90 days
Work in progress	1 days
Finished products	2 days
Cash in hand	5 days
Accounts payable	30 days
Repair and maintenance	3% of machinery cost

A. TOTAL INITIAL INVESTMENT COST

The total investment cost of the project including working capital is estimated at Birr 25.85 million, of which 41 per cent will be required in foreign currency.

The major breakdown of the total initial investment cost is shown in Table 7.1.

Table 7.1
INITIAL INVESTMENT COST ('000 Birr)

Sr. No.	Cost Items	Local Cost	Foreign Cost	Total Cost
1	Land lease value	1,660.80	-	1,660.80
2	Building and Civil Work	1,250.00	-	1,250.00
3	Plant Machinery and Equipment	1875.00	10,625.00	12,500.00
4	Office Furniture and Equipment	125.00	-	125.00
5	Vehicle	150.00	-	150.00
6	Pre-production Expenditure*	1236.15	-	1,236.15
7	Working Capital	8,933.88	-	8,933.88
	Total Investment cost	15,230.83	10,625.00	25,855.83

* *N.B Pre-production expenditure includes interest during construction (Birr 1.08 million , training (Birr 50 thousand) and Birr 100 thousand costs of registration, licensing and formation of the company including legal fees, commissioning expenses, etc.*

B. PRODUCTION COST

The annual production cost at full operation capacity is estimated at Birr 60.39 million (see Table 7.2). The raw material cost accounts for 91.05 per cent of the production cost. The other major components of the production cost are cost of utility and

depreciation which account for 3.40 % and 2.29 % respectively. The remaining 3.26 % is the share of cost of finance, repair and maintenance, direct labour and other administration cost.

Table 7.2

ANNUAL PRODUCTION COST AT FULL CAPACITY ('000 BIRR)

Items	Cost	%
Raw Material and Inputs	54,993.00	91.05
Utilities	2,052.45	3.40
Maintenance and repair	375	0.62
Labour direct	204.84	0.34
Labour overheads	85.35	0.14
Administration Costs	136.56	0.23
Land lease cost	-	-
Total Operating Costs	57,847.20	95.78
Depreciation	1,385.00	2.29
Cost of Finance	1,165.41	1.93
Total Production Cost	60,397.61	100

C. FINANCIAL EVALUATION

1. Profitability

Based on the projected profit and loss statement, the project will generate a profit through out its operation life. Annual net profit after tax will grow from Birr 1.78 million to Birr 3.42 million during the life of the project. Moreover, at the end of the project life the accumulated cash flow amounts to Birr 38.31 million.

2. Ratios

In financial analysis financial ratios and efficiency ratios are used as an index or yardstick for evaluating the financial position of a firm. It is also an indicator for the strength and

weakness of the firm or a project. Using the year-end balance sheet figures and other relevant data, the most important ratios such as return on sales which is computed by dividing net income by revenue, return on assets (operating income divided by assets), return on equity (net profit divided by equity) and return on total investment (net profit plus interest divided by total investment) has been carried out over the period of the project life and all the results are found to be satisfactory.

3. Break-even Analysis

The break-even analysis establishes a relationship between operation costs and revenues. It indicates the level at which costs and revenue are in equilibrium. To this end, the break-even point of the project including cost of finance when it starts to operate at full capacity (year 3) is estimated by using income statement projection.

$$\text{BE} = \frac{\text{Fixed Cost}}{\text{Sales} - \text{Variable Cost}} = 21 \%$$

4. Payback Period

The pay back period, also called pay – off period is defined as the period required to recover the original investment outlay through the accumulated net cash flows earned by the project. Accordingly, based on the projected cash flow it is estimated that the project's initial investment will be fully recovered within 6 years.

5. Internal Rate of Return

The internal rate of return (IRR) is the annualized effective compounded return rate that can be earned on the invested capital, i.e., the yield on the investment. Put another way, the internal rate of return for an investment is the discount rate that makes the net present value of the investment's income stream total to zero. It is an indicator of the efficiency or quality of an investment. A project is a good investment proposition if its IRR is greater

than the rate of return that could be earned by alternate investments or putting the money in a bank account. Accordingly, the IRR of this project is computed to be 18.90 % indicating the viability of the project.

6. Net Present Value

Net present value (NPV) is defined as the total present (discounted) value of a time series of cash flows. NPV aggregates cash flows that occur during different periods of time during the life of a project into a common measuring unit i.e. present value. It is a standard method for using the time value of money to appraise long-term projects. NPV is an indicator of how much value an investment or project adds to the capital invested. In principle a project is accepted if the NPV is non-negative.

Accordingly, the net present value of the project at 8.5% discount rate is found to be Birr 10.82 million which is acceptable.

D. ECONOMIC BENEFITS

The project can create employment for 37 persons. In addition to supply of the domestic needs, the project will generate Birr 9.34 million in terms of tax revenue. The establishment of such factory will create a backward linkage effect with the livestock sub sector.