

**ETHIOPIAN MEAT AND DAIRY
INDUSTRY DEVELOPMENT INSTITUTE**

**FEASIBILITY STUDY FOR THE ESTABLISHMENT OF MEAT
PRODUCTS PROCESSING**



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Bishoftu - Ethiopia

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EXECUTIVE SUMMARY

The meat processing pre-feasibility study paper is a clue to display investment viability. Hence the document enables to see in-depth financial analysis and sustainable socio-economic benefits of establishing export scale slaughterhouse, and link potential value chain actors of the livestock sector and improving the efficiency of all its elements from meat production, processing, handling, distribution, & marketing. The overall investment cost is considered be 202 million out of which 25%(50,613,838.4) is private equity while 75% (151,841,515.20) will be from loan incentive packages. Annual capacity of the envisaged cattle & goat meat processing plant is 1,000 tons/ annum. The plant is assumed to start production at 35% of its rated capacity in the first year, 55% in the 2nd year and full size (100%) starting from 5th production year. The visualized plant will operate 8 hours/ shift for 224 days/year and boost its output by working in two-shift basis. The raw materials will be the cattle, goats, and sheep of the rural areas of suppliers' association. Besides this; the project would generate a gross Birr 10 million /yearly economic viability, the company will have profound socio-cultural & technology transfer advantages.

1. INTRODUCTION

Ethiopia is endowed of potential sources to support the meat export from a variety of agro-ecology and diversified animals. The high stock number, however, is not leading to higher export earnings for meat. Ethiopia's annual exports of cattle and sheep meat thus valued at USD 79.13 million in 2012 (ECRA 2012), while Botswana with a much lower stock number can reach USD 150 million export earnings from beef alone (FAO 2012), indicating underexploited yet and in need of commercialization. The sub-sector has a promising future to dominate the future economy of the country. While the export is the primary sector for enhancing the foreign exchange earnings, there are the prevailing bottlenecks that prevent the industry from playing its role in the development of the national economy.

The meat processing pre-feasibility paper is aimed to assemble the subsisting information on live animal and meat market source and structure, to compile existing information on the opportunities and challenges of processed meat export marketing. There are different opportunities of meat demand in Ethiopia, like domestic consumption, official exports and high demand for animals by the export abattoirs. The population growth, urbanization, increases in

per capita income and export opportunities are fueling the demand for livestock meat products. The overall livestock development strategy revolves to foster private sector-led development with public sector providing enabling environment through policy interventions and play capacity building role to improve animal products and utilization practices. Within the next 10 to 20 years, Ethiopia expects to gain entry into high-value markets for meat, including those in U.S.A and the EU, by developing a credible SPS certification system for disease-free meat. However; various internal and external factors described here as the challenges of beef marketing system that are the following. These are among others absence of market information system, the inadequacy of promotional activities, supply problems, the prevalence of diseases, and traditional production system, and illegal export trade, the lack of infrastructure, competition, repeated bans and inadequate port facilities. From this review, it has been recommended that significant disease should have to manage, legal channels, market infrastructure, and service facilities along borders and implementation of strategies with neighboring countries for legalizing trade should have to promote. Livestock transportation services, improved slaughter house, lairage, storage and quarantine facilities at required sites should be present. Also, the government should be actively involved in the control of the illegal trade of live animals across the borders.

Strengthening export performance through improved competitiveness, the World Bank Group identifies bottlenecks and offers recommendations on how Ethiopia can maximize its earnings by adding quality from existing, primarily agriculture, export base. Concrete tasks are executed to increase Ethiopia's competitiveness in Middle East meat market regarding laboratory, chilled storages, loading docks and transport as well as certified abattoirs. Expanding market destination, establishing disease-free zone, integrated husbandry system. Establishment of rendering plant to mitigate abattoir wastes & exploit the resources, by mutual understanding to build waste treatment in the cluster and financing abattoirs by environment mitigation grants is timely intervention scenario.

1.2. Purpose of the study

To see in-depth financial analysis and sustainable socio-economic benefits of establishing export scale Slaughter House

To link potential value chain actors of the livestock sector and improving the efficiency of all its elements from meat production, processing, handling, distribution, and marketing.

To provide a real-time analysis of the market opportunity with factual data that will lead towards overall improvement in Livestock sector of economy.

3. Brief description of the project & product

Ethiopian cattle meat product has received a fabulous deal of attention over the past decade due to the rapid growth of its exports to the rest of the world since meat export has become one of the most dynamic sectors in international trade for it is increasingly important to Ethiopia's economy. This growth has undoubtedly contributed to increased rural incomes and reduced rural poverty in Ethiopia. Despite this increase, exports from the livestock sector remain a small fraction of Ethiopia's overall agricultural sector. In Ethiopia cattle, goats, sheep, camel and poultry, in order of magnitude, are used as a resource base for meat production; however, the first three species are the most common.

As the country has the largest number of livestock in Africa, Ethiopia has much to gain from the growing global market for animal meat products. Ethiopia has some livestock market opportunities that if realized will power the growth of the meat export industry and value chain along with the overall economy. Ethiopia exports live animals to the countries in the Middle East. However, processed meat is more lucrative regarding the price of the international standard has attained in packaging and storage.

Table 1:-Livestock population in Ethiopia (2014/2015)

S/no	Livestock type	Population (in million)
1	Cattle	56.71
2	Sheep	29.33
3	Goats	29.11
4	Camel	1.16

Economic growth is a primary driver of meat demand which results in increased consumption at higher prices, especially for red meats. The Middle East is experiencing unparalleled growth in food service due to investments in tourism. The market was historically frozen carcasses, but the market now wants chilled lamb cuts for the growing food service and retail sectors. To enter these segments directly then Ethiopian processors will have to employ strict food safety measures and control the prevalence of diseases. Because of lower labor costs than Australia and New Zealand, Ethiopia would have an advantage on processing boneless beef and sheep meat cuts. Special processing of variety meats could also be delivered to client specifications. There is certainly an opportunity to consider deboning whole carcasses into primal pieces for further processing in an importing country. Beef cuts could be pre-cooked for High Return Income markets, hotels or restaurants. Again, market research is needed on the requirements in the various end markets.

4. CRITICAL FACTORS

Ethiopian export is directed by few raw or semi-processed agricultural products which have been the main contributors to the country's foreign exchange earnings. This feature is expected to continue with some progressive developments during the GTP 2. Low levels of industrial development with limited volume and quality have continued to inhibit competitiveness and market needs in the international market. Lack of diversification in the export of commodities and dependence on monolithic commodity export characterizes the overall nature of national products exportation. One can mention several issues related to packaging, logistics, and inefficiencies in processing the products. Unless the suggested above the web is sorted out, the country's export sector will face a vicious circle from which it cannot thrust in the short run. Moreover, the absence of export marketing skills and limited managerial and technical capabilities in the private business sector, little market promotion schemes; lack of trained workers on international marketing intelligence. Inability to access information on latest technologies regarding raw material needs and foreign trade opportunities need to be adequately discussed. Incapability of transforming the raw export items into processed or finished products by adding value to the products has subjected Ethiopia to huge loose of foreign exchange earnings which the nation could have claimed.

Notwithstanding the issues mentioned above, some recommendations that can be considered by all concerned are indicated as follows: -Ethiopian exporters will need to implement tactics based

on category management principles to improve supply chain performance. Merchandising tactics include: Food tasting, new Point-of-Sale (POS) materials, print media advertising, and a video on guaranteed Halal and some of these activities can begin while the exporters wait for the Gulf markets to reopen.

Ethiopia currently exports through formal market channels nearly half a million head of animals per year and those numbers are increasing by 15-25% per year. This rapid rise in the export of live animals creates a conundrum for the country because by lowering the number of live animals exported, Ethiopia would see a reduction in the overall revenue attributed to live animal exports. However; the animals that remain in the country be processed into value added products such as meat, leather and leather products, which will create more jobs and new export markets. An increase in the number of live animals exported, on the other hand, would generate growth of revenue (GDP) to the country, but the meat and hides, skins and leather industries would continue to suffer shortages of raw material. Addressing the export market for live animals is a balancing act that the Government of Ethiopia and the value chain actors will need to address to reach a balance that satisfies the entire value chain.

Lack of suitable slaughtering facility and unsatisfactory slaughtering techniques cause considerable losses in meat as well as valuable by-products like blood skin hides, and offal's animals slaughtered in place which frequently polluted with blood and other hazardous elements.

5. GEOGRAPHICAL POTENTIAL FOR INVESTMENT

The potential market concerning livestock products export in the MENA is because of the geographical advantage that enables to deliver fresh, safe and quality meat on short time than other competent countries like India and Brazil. In the near term, the SPS-LMM program seeks to first improve access for Ethiopian meat into the Middle East and North Africa markets/ MENA including the Gulf Cooperation Council countries of Saudi Arabia, The United Arab Emirates, Kuwait, Qatar, Oman and Bahrain, as well as Egypt, Lebanon, Jordan, Yemen and Comoros.

6. MARKET BACKGROUND

A. The Global Demand for Variety Meats

The world trade in variety meats was valued at \$3 billion in 2004 and \$4 billion in 2005. The top four exporters of beef and sheep variety meats are Australia, USA and Canada and New Zealand in the order of their exports. The world price for variety meats was \$773/metric tons in 2005 and \$886/metric tons in 2006, indicating higher demands to remark livestock revolution in the current era.

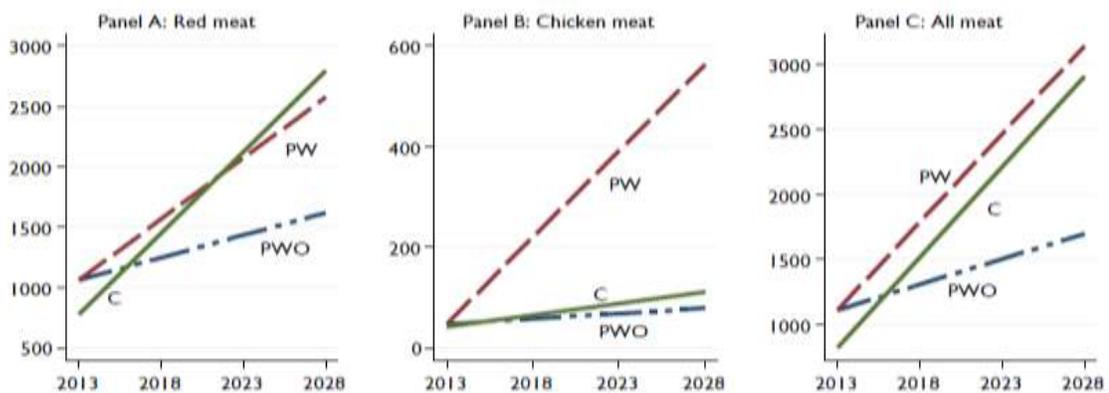
The Global Demand for Variety Meats

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The Domestic Demand in Ethiopia for Variety Meats

The local demand in Ethiopia for variety meats is high because consumers are seeking affordable meat protein for their level of income.

Figure 1: Production & consumption requirement projections from 2013 to 2028 with & without investment intervention. (Source: Livestock roadmaps 2015)



7. CURRENT SITUATION OF THE SECTOR & INDUSTRY STRUCTURE

Recently established abattoirs are built with the better capacity for beef, mutton & chevron slaughter, deboning, cutting, vacuum packing and exporting frozen meat. These export abattoirs, however, are too far from rural areas to obtain a sustainable supply of price-competitive slaughter animals. The cost of transport from rural areas to these locations (Bahir Dar and Mekelle) erodes the competitiveness of products processed through these abattoirs. As a result, Abergele export abattoir that started exporting frozen beef in 2009 to Angola and Comoros could not sustain its operations because of competitiveness issues and stopped its activities in early 2012. Additional bigger slaughterhouse projects are expected to be implemented shortly to meet expectations of the Ethiopian Government for its Growth and Transformation Plan. It is planned to export 111,000 ton of meat in 2015 valued at USD 400 million, which seems overly ambitious judging by the current performance of existing export abattoirs and the reluctance of the new companies to actively engage exports. Earnings from animal exports (meat and live animals) during the period 2000 to 2012 increased from USD 2 million in 2000 to more than USD 200 million each year from 2010. Earnings from live cattle exports have been the highest over the last six years.

Table 2:-Ethiopian meat Export performance (2000-2012)

Meat types	2000	2002	2004	2006	2008	2010	2012
Beef	294000	352500	336000	374000	380000	420000	338150
Sheep meat	36000	47720	60409	79000	81500	86000	86000
Goat meat	25560	32725	44180	55000	64600	66300	68000
Chicken meat	37600	54064	47096	45200	48589	59200	60480
Camel meat	11050	13430	13940	12750	28900	31450	19800

Table 3:--Current cost analysis of shoat meat processing of export slaughter houses

Cost of Sheep/Goat estimation	Revenue estimation
	Selling Price 1kg carcass FOB Bole airport = 4.95USD/Kg
Live weight av. 25 Kg	10kg carcass = 4.95x10 = 49.5 USD= 1,069.7 Birr
Purchasing Price 37 birr/kg = 37x25=	Offal`s Sells = 25 birr/Head
Dressing Percentage = 40%, (40% x 25Kg = 10kg carcass weight	Skin sells = 15 birr/head
(DP = Carcass wt. divided by live wt. times 100%)	Profit= Sells (Carcass + Offal + Skin) – Costs (Purchasing + Overhead) ETB= 1109.70 Birr
Overhead costs including depreciation = 90 birr/head	94.7*112,000=10,605,840Birr/year from shoat alone before taxation

8. OPPRTUNITY RATIONALE

There are higher livestock production potentials in Ethiopia for different reasons. These are that existence of large animal population, diverse genetic resources, diverse ago-ecologies, different livestock production systems, increased demand for livestock products, growing interest in market oriented livestock production, less commercialization, inadequate livestock product processing and by-product (offal) investment opportunities in livestock sectors that include:

- ❖ Establishment of ranches
- ❖ Establishment of meat export abattoir
- ❖ Rearing and breeding of cattle;
- ❖ Livestock fattening and export
- ❖ Trading of cattle domestically after the completion of fattening
- ❖ Production and processing of feed for domestic market and use
- ❖ Processing of offal for export

9. SUPPLY AND DEMAND ASSESSEMENT

9.1. Present supply and demand

The product envisaged here is mainly for export. Thus, to estimate the potential market for the product, it was found more appropriate to rely on export market rather than local demand. In the annual report published by National Bank of Ethiopia, cattle meat is said lumped with other types of meat products. To determine the volume of livestock meat exported annually, it was, therefore, necessary to employ opinions of knowledgeable persons in the field.

The animals are mainly sourced from pastoral lowlands and are primarily intact male yearlings. The other important channel is the free live goat export channel. The number of animals informally crossing Ethiopia's borders to neighboring countries has different implications. This channel is competing with domestic consumers and export abattoirs, which leads to higher domestic prices for live animals. Afore-mentioned, in turn, threatens the competitiveness of export abattoirs and the resulting supply shortage compels these abattoirs to operate under their installed capacity. There is a significant loss of hard currency because of the informal cross-border trade. Another important aspect is the flow of benefits among actors that highlights the efficiency of the different marketing channels identified in the Ethiopian small ruminant value chain. We computed gross margin (marketing margin), net marketing margin and producer share of the final price of sheep and goats. Informal live animal exports benefit individual farmers, but suppress national revenue and the resulting long-term development activities that could be financed by the government.

The export abattoirs buying sheep and goats to export chilled carcasses to the Middle East and North African countries, purchase animals at the factory gate from large-and small-scale traders that can supply at least one truckload at a time. As indicated above, some export abattoirs provide premium prices for those businesspeople that can supply thousands of animals in a week. In addition to premium prices, some abattoirs deploy their trucks at a cost to collect animals that are already procured by their suppliers. Unlike other buyers, export abattoirs buy animals on a live weight basis, and the animal weighed after it has rested for 24 hours in the holding area at the factory gate. Here is to avoid filling animals with water which is ordinarily done by feeding salt to add extra weight when selling on a live weight basis. Export abattoirs compete, which increases the per kg live weight price, especially during the peak Ramadan fasting seasons. Most of the export abattoirs are built in Bishoftu and Modjo areas. Transporting animals from the Somali rural areas beyond Babile is becoming less feasible, and there are projects to establish export abattoirs in these regions.

9.2. Projected Demand

As it is used to estimate the present demand, the future export market for processed meat is also forecasted based on the possible assumption that the market for the product should grow following the time trend analysis made on the export quantity of cattle meat over the years 1997-2005. Hence, the equation $Y=366 + 66.57 X$ is used to project the future export market as depicted in Table 4.

Table 4:-Projected demand (tons)

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Demand	699	765	832	899	965	1032	1098	1165	1231	1298	1365

Table 5: Livestock GDP for baseline years 2015 and 2020 with red meat intervention/million birr

Products	Total livestock GDP 2015 (in ETB millions)—baseline	Total livestock GDP 2020 (in ETB millions)—with red meat intervention	% change in national livestock GDP
Meat in the LG			
Cattle	5272	8062	53%
Sheep	2893	4503	56%
Goats	3979	6452	62%
Camels	3614	4813	33%
Meat in the MRD			
Cattle	7410	8318	12%
Sheep	1549	2518	63%
Goats	1070	2319	118%
Meat in the MRS			
Cattle	11,025	15,072	37%
Sheep	2499	4565	83%
Goats	885	1497	69%
TOTAL	40,196	58,119	44.6%
<ul style="list-style-type: none"> The GDP contribution of red meat from the ITMM system in all typology zones has shown an overall increase by 45% compared to the 2015 GDP. This amounts to ETB 40 billion in 2015, compared to 58 billion in 2020. 			

10. PRICING

Based on the present world market the factor price of Birr 1109.70 per goat meat is adopted for financial analysis. This is from the existing market price at meat processing industry. Since the project is envisaged for export purpose, it is recommended that the factory should engage itself in exporting the products directly.

11. PLANT CAPACITY

Based on the market study depicted above and the availability of major raw material in all the Ethiopian regional states, the annual capacity of the envisaged cattle, camel & shoat meat processing and packing plant is chosen to be 1,000 tons per annum.

12. RAW MATERIALS AND UTILITIES

The major raw materials required for meat processing and packing plant are oxen (bulls, bullocks, and cows) sheep & goat, packing stockinet and carton. The total annual cost of utilities at full capacity is estimated to be Birr 81,900. The source of cattle, sheep, goat & camel will be lowland pastoralists areas. The total material cost is about Birr 118,702,000. The list of raw materials requirement broken up by source is presented in the Table 6.

Table 6:-Raw materials and utilities requirement and cost

Particulars	Quantity	Unit cost	L.C.	F.C.	Total cost
Cattle	1,600 Cattle (200ton meat)	15000	24,000,000	20000	24,000,000
shoat meat	800ton meat 112000 goats	800	89,600,000	1000	89,600,000
Packaging (pcs)	1,000,000	0.22	220,000		220,000
Total Material Cost			4,882,000		4,882,000
sub total					118,702,000
Utility					
Electricity	120,000 kwh		66,000		66,000
Water	6,000 m3		15,900		15,900
Total Utility Cost			118,783,900		81,900
Grand total					118,783,900

13. PRODUCTION PROCESS

The cattle, sheep and goat supplied to the slaughterhouse are unloaded along the reception using adjustable ramp into lair age barrens /pens for rest and then weighed on a weighing balance ground. The targeted animals undergo a medical checkup for the presence of any disease before they are slaughtered. They are stunned by a gun in a box and afterwards slaughtered and removed to the bleeding line where blood is collected in a basin. The carcasses are loaded by

electric hoist from the slaughter line to the processing line Loading, spreading of rear legs and deriding are carried out on at here level plat form, and final deciding done on a two-level plat form by means of a pneumatic knife. The horns are removed by electric saw, and the heads inspected and washed. The brisket is opened by electric saw, the entails inspected and extracted. Stomach and casings are transported for cleaning. Carcasses are split into halves, which are washed and inspected. The meat is cut on tables in a cutting room by means of electric or hand operated saws and knives. Then, the meat is washed to remove blood and kept in the chilled room.

The meat is then dressed and superficial fat is removed before processing further after trimming and chopping. The bones are removed and the meat is then cut to uniform size of sliced chunks of 1.25cm thickness. The meat is then soaked into salt-water for giving a salty taste and to kill microorganisms. It is weighed and filled into can sand seaming process will be carried out. After seaming the can surfed into a jet-spraying can washer for cleansing with a neutral cleanser. Then, the seamed can undergo sterilization immediately. The by-products of cattle meat processing industry represent a substantial part of the sales value of production derived from the slaughtered cattle. By-products include edible fat, non-edible fat, hides, blood, bone meal, glue, etc. The efficient utilization of by products is essential for the economic operation of a processing plant. The total annual revenue obtained from the sale of these by- products is estimated at Birr 1.368,000.

Export abattoirs slaughter sheep and goats, chill the full carcass and wrap it with cotton linen when shipping them. They also freeze offal in plastic bags and pack them in labeled cartons for shipment. Supermarkets also prepare shoat meat in different cuts, pack it in plastic and make the product ready for distribution from their retail outlets. Butchers roll cuts of carcasses as per the order of the buyer for take away. Hotels process the meat into different dishes to serve on site: however, take away and the associated packing are not common from hotels.

Meat processing technology comprises the steps and procedures in the manufacture of processed meat products. Processed meat products, which include various different types and local/regional variations, are food of animal origin, which contribute valuable animal proteins to human diets.

Animal tissues, in the first place muscle meat and fat, are the main ingredients, besides occasionally used other tissues such as internal organs, skins and blood or ingredients of plant origin. All processed meat products have been in one way or another physically and/or chemically treated. These treatments go beyond the simple cutting of meat into meat cuts or meat pieces with subsequent cooking for meat dishes in order to make the meat palatable. Meat processing involves a wide range of physical and chemical treatment methods, normally combining a variety of methods. Meat processing technologies include:

- ❖ Cutting/chopping/comminuting
- ❖ Mixing/tumbling,
- ❖ Salting/curing
- ❖ Utilization of spices/non-meat additives
- ❖ Stuffing/filling into casings
- ❖ Fermentation and drying,
- ❖ Heat treatment and Smoking

14. ENVIRONMENTAL IMPACT

The envisaged plant needs waste water treatment plant that uses the physicochemical system to abate the environmental pollution. The treatment process involves settling, filtration, the addition of flocculates and mixing, and floatation. The sludge from the treatment plant utilized as fertilizer. It is apparent that there is a shortage of animal feed like Blood and Bone meals as well as organic fertilizers (bio-phosphate) which could remain resolved by exploiting the slaughterhouse waste products that otherwise demand expenses more economy and environmental pollution. This underexploited resource will indeed create potential value chain actors will also bring new technologies like rendering plant and create capital and employment opportunities of all round citizens.

15. PROJECT COST SUMMARY

15.1. Project economics

This profile envisages the establishment of the facility for the processing of 200 tons' cattle and 800 tons of shoa meat with a total capacity of 1000 tons/ annum. The present demand for the proposed product is determined at 499.14 tons per annum. The demand is expected to reach at 1,365 tons by the year 2020. The plant will create employment opportunities for 75. The total investment requirement is estimated at Birr 202,455,353.6 out of which 6,280,298.2 Birr is required for plant and machinery.

Table 7:-Annual production cost at full capacity

S/no	Items	Rates with time
1	Construction period	1 year
2	Source of finance	25 % equity: 75 % loan
3	Tax holidays	5 years
4	Bank interest	12%
6	Accounts receivable	30 days
7	Raw material local	10 days
8	Work in progress	2 days Finished
9	Finished products	15 days Cash in
10	Cash in hand	5 days' accounts payable

15.2. Project financing

The total investment cost of the project including working capital is estimated at Birr 202 million, of which 53% required in foreign currency = 100,600,000 Br. The major breakdown of the total initial investment cost shown in Table 6.

Particulars	Investment	Owner's Capital (25%)	Loan (75%)
Total physical asset investment	100,000,000	25,000,000	75,000,000
Working Capital	33,372,073.35	8,343,018.338	25,029,055.01
Pre-Operational expenses	69,083,280.20	69,083,280.20	-
Total	202,455,353.60	50,613,838.4	151,841,515.20

15.3 Project cost

Pre-production expenditure includes interest during construction (Birr 69.08 million) training (Birr 50 thousand) and Birr 100 thousand costs of registration, licensing and formation of the company including legal fees, commissioning expenses, etc.

Table 8:-Initial investment cost

S/No	Description	total cost (USD)	Amount/birr rate 21.61
1	Cost of land	28,500	615,885
2	Cost of construction of cold storage (1000 tons mutton & beef	2,050,000	44,300,500
3	Meat processing equipment & machinery	587,000	12,685,070
4	Chillers/ Quick freeze units	23,000	497,030
5	Refrigerator containers 4	91,000	1,966,510
6	Furniture & Fixture	1200	25,932
7	Refrigerated trucks for transport of meat 2	115,000	2,485,150
8	Cost of software for identification of meat based quality	5,500	118,855
9	Vehicle for routine activity facility & service (2)	5,000	108,050
	Fixed investment cost (sub-total)	2,906,200	62802982
	Contingency (10%)	290620	6,280,298.2
	Total pre-production capital expenditure	3,196,820	6,908,280.2
	Total initial investment		100,000,000
	Working capital at full capacity		33,372,073.35
	Total		202,455,353.6
	Loan	75%	151,841,515.2

15.4. Machinery & equipment, land, buildings and civil works

The total cost of equipment and machinery required to produce 1,000 tons of processed meat per annum is estimated to be about **62.8 million Birr**, of which Birr 6.5 million is required in foreign currency.

Table 9:-List of machinery and equipment

Sr. no.	Description	Qty.
1.	Electric hoists	4
2.	Stunning box	1
3.	Stunning gun	1
4.	Platforms for cattle & goat processing	7
5.	Electric saw for cutting and splitting	4
6.	Pneumatic knife	1
7.	Hooks for various purposes	260
8.	Pneumatic spreader	1
9.	Boiler and Sterilizer for processing tools	5
10.	Processing and inspection tables	13
11.	Pipe rail with supporting construction	650m
12.	Rail balances up to 500kg	2
13.	Cattle balance up to 2000kg	1
14.	Floor balance up to 200kg	1
15.	Machine for Washing and cleaning of stomach	1
16.	Devise for casing processing	1
17.	High effect pumps for washing	2
18.	Pumps for discharging manure	2
19.	Laboratory equipment	1 set
20.	Stainless Tank	2
21.	Gear Pump	1
22.	Balance	20
23.	Seaming Micrometer	2
24.	Seaming Wire Gauge	2
25.	Seaming Scale	2
26.	Seam band Saw Frame	2
27.	Seam band Saw	10
28.	Vacuum Can Tester	2
29.	Hand Can Tester	2
30.	Saccharimeter	2
31.	Inspection Bar	2
32.	Thermometer	15
33.	Salinometer	2

I. Proposed Location

The envisaged plant is proposed to be established at a place where the common understanding of the federal investment agency has considered as conducive industrial parks.

II. Land, Building and Civil Work

The envisaged plant will require a total land area of 5000 m², of which 3000 m² will be covered by factory and office buildings, stores, etc. Cost of land at lease (Table 10). Amenities Block includes washrooms, laundry, kitchen and dining room, Office Block with offices for General Manager, Chief Engineer, Veterinary Surgeon, Accounts Marketing Manager, Workshop Manager, Veterinary Laboratory, Cashier, Stores, etc.

Table 10:- Land leasing finance

Leasing				
land area(m2)	cost/m2	total /80 years	10%	yearly payments
5000	123.177	615885	61588.5	7698.56

15.5. Manpower required and labor cost

The manpower requirement of the plant will be 75 persons. Table 11 shows the details of manpower requirement of the plant and estimated annual labor cost including fringe benefits. The total man power cost including fringe benefit is estimated at Birr 3,463,920.00.

Table 11:-Manpower requirement and estimated annual labor cost

Sr. No.	Description	Req. No.	Monthly Salary	Annual Salary
1	Plant Manager	1	16,000	192,000
2	Secretary	2	1,500	36,000
3	Finance & Administration Manager	1	7500	90,000
4	General Service	1	5000	60,000
5	Production and Technical Manager	1	8000	96,000
6	Production Head	1	9000	108,000
7	Technical Head	1	6500	78,000
8	Commercial Manager	1	5500	66,000
9	Purchaser	1	4000	48,000
10	Salesman	1	4000	48,000
11	Accountant	2	6000	144,000
12	Personnel	1	3500	42,000
13	Time-keeper	3	850	30,600
14	Store-keeper	2	750	18,000
15	Veterinary Doctor	1	15000	180,000
16	Quality control head	1	15000	180,000
17	Chemist	3	5000	180,000
18	Food Technologist	1	6000	72,000
19	General Mechanic	3	5000	180,000
20	Assistant Mechanic	3	4000	144,000
21	Electrician	3	3500	126,000
22	Operators	10	2,500	300,000
23	Daily Laborer's	20	1,200	288,000
24	Driver	4	2500	120,000
25	Guard	4	800	38,400
26	Cleaner	3	600	21,600
	Sub-total	75	139,200	2,886,600
	Employees benefit 10% of basic salary			288,660
	Grand Total			3,175,260

TRAINING REQUIREMENT

The manpower requirement of the plant will be 75 persons. Table 11 showed the details of manpower requirement of the plant and estimated annual labor cost including fringe benefits. The total manpower cost including fringe benefit is estimated at Birr 3,463,920.00. The financial analysis of the cattle, sheep & goat meat processing project is based on the data presented in the previous chapters and the following assumptions: -

Table 12:-Construction Finance

S/no	Items	Rates with time
1	Construction period	1-2 years
2	Source of finance	25 % equity: 75 % loan
3	Tax holidays	5 years
4	Bank interest	12%
5	Discount cash flow	18%
6	Accounts receivable	30 days
7	Raw material local	10 days
8	Work in progress	2 days Finished
9	Finished products	15 days Cash in
10	Cash in hand	5days accounts payable
11	Spare Parts, Repair & Maintenance	3% of fixed investment

15.6. FINANCIAL ANALYSIS

Meat Purchase and Sales Purchase Volume

	Year 1	Year 2	Year 3	Year 4	Year 5
Cattle Purchase	24,000,000	32,950,820	48,850,000	48,850,000	48,850,000
Shoat Purchase	89,600,000	91,205,554	136,562,280	136,562,280	136,562,280
Meat Loss	1,136,000	-	-	-	-
Net meat available	112,464,000	124,156,374	185,412,280	185,412,280	185,412,280
Sales Volume					
Processed Cattle meat	300,000	315,550	440,650	440,650	440,650
Processed Shoat meat	1,280,000	1,457,000	1,680,256	1,680,256	1,680,256
Sales in Birr					
Processed Cattle meat	33,991,650	35,753,550.52	49,928,068.57	49,928,068.	49,928,068.
Processed Shoat meat	145,031,040	165,086113.5	190,382,246.20	190,382,246	190,382,246
Total Sales	179,022,690	200,839,664.0	240,310,314.77	240,310,314	240,310,314
Purchase Cost	113,600,000	124,156,374	185,412,280	185,412,280	185,412,280

Project Income Statement

Particulars	Year 1	Year 2	Year 3	Year 4	Year 5
Sales	179,022,690	200,839,664	240,310,314.77	240,310,314.7	240,310,314.7
Costs and Expenses					
Purchase of cattle, goats & sheep	113,600,000	114,963,200	137,556,706	137,556,706	137,556,706
Gross profit	65,422,690	85,876,464	102,753,608.77	102,753,608.7	102,753,608.7
Operation expense					
Salaries	2,886,600	4,080,620	6,220,548	6,220,548	6,220,548
Benefits(Incentives)	288,660	408,062	622,054.8	622,054.8	622,054.8
Depreciation	10,605,840	8,677,700	6,723,825	6,723,825	6,723,825
Packaging & materials	5,102,000	5,102,000	5,102,000	5,102,000	5,102,000
Promotion and	60,000	60,000	60,000	60,000	60,000
Lease/Rent	7698.56	7698.56	7698.56	7698.56	7698.56
Car running Expense	5,372,800	5,372,800	5,372,800	5,372,800	5,372,800
Interest Expense	18,220,981.	14,576,785.	10,932,589.08	7,288,392.72	3,644,196.36
Utilities	81,900	81,900	81,900	81,900	81,900
Total Oper. Expenses	42,626,480	38,367,566	35,123,415	31,479,219	27,835,023
Net Income	22,796,210	47,508,898	67,630,194	71,274,390	74,918,586
Provision for Tax	2,279,621	4,750,890	6,763,019	7,127,439	7,491,859
Net Income After Tax	20,516,589	42,758,008	60,867,175	64,146,951	67,426,727

Project Cash flow

Particulars	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Cash in flow						
Cash sales		179,022,690	200,839,664	240,310,314.	240,310,31	240,310,314.7
Loan Received	151,841,515.					
Own investment	50,613,838.4					
Total Cash inflow	202,455,353.	179,022,690	200,839,664	240,310,314.	240,310,31	240,310,314.7
Cash outflow						
Investment cost	169,083,280					
Purchase cost		113,600,000	114,963,200	137,556,706	137,556,70	137,556,706
Depreciation		10,605,840	8,677,700	6,723,825	6,723,825	6,723,825
Packaging & materials		5,102,000	5,102,000	5,102,000	5,102,000	5,102,000
Salaries		2,886,600	4,080,620	6,220,548	6,220,548	6,220,548
Overhead cost& other		5,811,059	5,930,461	6,144,453.36	6,144,453.	6,144,453.36
Interest Expenses		18,220,981.80	14,576,785.4	10,932,589.0	7,288,392.	3,644,196.36
Loan Repayment		30,368,303	30,368,303	30,368,303	30,368,30	30,368,303
Total Cash outflow	169,083,280	186,594,784	183,699,069	203,048,424	199,404,22	195,760,032
Net cash flow	33,372,073.6	(7,572,094)	17,140,595	37,261,890.7	40,906,086	44,550,282.77
Beginning cash balance		33,372,073.60	25,799,979.6	42,940,574.6	80,202,465	121,108,552
Ending Cash Balance		25,799,979.60	42,940,574.6	80,202,465.3	121,108,55	165,658,834.7

Measurement of project worthiness

Net Present Value (NPV) and Benefit ratio (BCR) computation at 12% discount rate

Year	Investment	Gross Cost (oper+prod.cos t)	Discount factor	Present Value(birr)	Gross Benefit(birr)	Discoun t factor	Present Value(birr)
0	169,083,280	169,083,280	1.000	169,083,280			
1		42,626,480	0.893	38,065,446.64	65,422,690	0.893	58,422,462.2
2		38,367,566	0.797	30,578,950.1	85,876,464	0.797	68,443,541.8
3		35,123,415	0.712	25,007,871.48	102,753,609	0.712	73,160,569.6
4		31,479,219	0.636	20,020,783.28	102,753,609	0.636	65,351,295.3
5		27,835,023	0.567	15,782,458.04	102,753,609	0.567	58,261,296
Total		344,514,983	0.734	298,538,790	459,559,981	0.734	323,639,164.90

Net Present Value (NPV)

$$\begin{aligned}\text{NPV} &= \text{Present value of gross benefit} - \text{Present value of gross cost} \\ &= 323,639,164.90 - 298,538,790 \\ &= \underline{25,100,379.90}\end{aligned}$$

The net present value is greater than zero. Therefore, this meat processing project is accepted.

Benefit- Cost Ratio (BCR)

$$\begin{aligned}\text{BCR} &= \frac{\text{Present Value of gross benefit}}{\text{Present Value of gross cost}} \\ &= \frac{323,639,164.90}{298,538,790} \\ &= \underline{1.08}\end{aligned}$$

The ratio is greater than one. This means that the project owner will recover the investment and can get enough return on its implementation.

Loan Repayment Schedule

Year	Principal Outstanding	Installment due payable	Interest at 12%	Total Payment
1	151,841,515	30,368,303	18,220,981.80	48,589,284.8
2	121,473,212	30,368,303	14,576,785.44	44,945,088.44
3	91,104,909	30,368,303	10,932,589.08	41,300,892.08
4	60,736,606	30,368,303	7,288,392.72	37,656,695.72
5	30,368,303	30,368,303	3,644,196.36	34,012,499.36
Total	0	151,841,515	54,662,945.40	206,504,460.4

16. CONCLUSIONS

Ethiopian meat export has received a great deal of attention over the past decade due to the rapid growth of its exports to the external world. Meat export has become one of the most dynamic sectors in international trade since it is increasingly important to Ethiopia's economy. This growth has undoubtedly contributed to increased rural incomes and reduced rural poverty in Ethiopia. Despite this increase, exports from the meat export remain a small fraction of Ethiopia's overall agricultural sector. Ethiopian meat has a good taste profile in some countries, including Egypt, Angola and some countries in the Middle East. Besides to the larger livestock production potentials in Ethiopia for the fact that existence of high livestock population, diverse genetic resources, diverse agro-ecologies, different livestock production systems, increased demand for livestock products, increased interest in market oriented livestock production, less commercialization. Moreover; inadequate livestock product processing and by-product (offal) investment opportunities in livestock sectors that include: establishment of ranches, the establishment of meat export abattoir, rearing and breeding of cattle; processing of offal for export, depending on investment location - exemption from export duties and taxes. Additionally, investors of export industries are entitled to keep 10 percent of foreign currency generated in private accounts.

The envisaged project possesses a wide range of benefits that help promote the socio-economic goals and objectives stated in the strategic plan of the agro-processing parks of Regional States. It boosts inter-sectorial linkage between the agricultural (livestock) and industrial sector. At the same time, therefore, it helps diversify the economic activity of the nation. The other major benefits are listed as follows: profit & income generation, tax revenue, and employment.

17. RECOMMENDATION

Based on the above conclusion the following recommendations are forwarded:

- ❖ The major disease should be controlled by strengthening the present veterinary service through vaccination and availing veterinary drugs.
- ❖ Conducive legal channels need to be developed.
- ❖ Market infrastructure and service facilities along borders, and implementation of strategies with neighboring countries for legalizing trade should be developed.

- ❖ Major infrastructure for livestock marketing like livestock transportation facilities, improved slaughter house, livestock resting sites, and storage and quarantine facilities at required sites should be present.
- ❖ The government should be actively involved in the control of the illegal trade of live animals across the borders.
- ❖ Sanitary conditions at slaughtering facilities along with employees training could be in a place.
- ❖ Cold chain management – Chiller facilities, quality labeling and packaging materials at abattoirs must be sufficient.

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