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FEED MILL PRODUCTION FEASIBILITY STUDY FOR SOUTHERN AFGHANISTAN

Commercial Feed Mill Project & Implementation with Supporting Livestock & Poultry Feeding Systems

Analysis and Recommendations

Prepared by:

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CONTENTS

EXECUTIVE SUMMARY

The ALP/S-supported Feed Mill Production Feasibility Study for Southern Afghanistan, done by consultant Mark LaGrange, had three different segments. The first segment studied the feasibility of a feed mill for southern Afghanistan; the second segment the feasibility of a lamb feeding operation in the same region; and the third the feasibility of a chicken broiler production operation in the region as well.

While the consultant Mr. LaGrange did a very thorough job on the equipment needs, marketing and other issues surrounding feasibility, ALP/S felt that the financial analysis wasn't as strong as it would like, and therefore performed supplemental analysis. The following is an Executive Summary of ALP/S' views of the study, including it's additional analysis.

Commercial Feed Mill

There is a very strong need for a commercial feed mill in southern Afghanistan, given the large herd sizes of livestock (sheep, goats, dairy cattle, etc.), and poultry, and the lack of nutritional feed to service this need.

A feed mill in southern Afghanistan could also service much of Afghanistan, given the large amount of grains available in the region, road access, etc.

The primary competition to a commercial feed mill in Afghanistan are feeds imported from Pakistan. However, such feeds are of very poor and inconsistent quality.

An Afghan feed mill is expected to be profitable, with an anticipated profit of US $812,370 in year one, rising to US $1,195,150 in year three. The Internal Rate of Return for such a mill is estimated at 26.9%, which is strong.

In short, it is the study's recommendation that a mill of this type in southern Afghanistan, and in particular in Lashkargah, would be feasible, viable and profitable.

It should be noted, however, that it is ALP/S' recommendation that such a mill be smaller in size than that recommended by Mr. LaGrange, in order to decrease the need for up-front capital.

A final caveat to the study is that, although such a mill makes sense on paper, if the political and security situation in southern Afghanistan deteriorates substantially, such a mill may become unsustainable.

Commercial Lamb Feeding Operation

Like the feed mill business described above, the study and its supplement indicate that a lamb feeding operation would likely be a good business opportunity for southern Afghanistan.

Such an operation also makes sense culturally, in that much smaller operations presently exists as "artisan" businesses in the region, and have for centuries.

Markets for sheep in Afghanistan and the region certainly exists, and other studies have shown that Afghan consumers on average will pay more for mutton than for any other meat.

A lamb feeding operation of the size described in the study (960 lambs sold/year by year two) is expected to be profitable, with a profit in year one estimated at US $9,707, year three at US $12,055, and an IRR of 18.3% after taxes.

Similar to a feed mill, if the political or security situation deteriorates substantially in the region, it could be very difficult for a lamb feeding facility to operate.

Broiler Production Operation

Like the two facilities described above, a broiler operation in southern Afghanistan would also be expected to be profitable. However, a broiler production business at present is considered to be less viable than the two operations described above, due to concerns about bird flu and its impact on the market.

A business of this size (19,000 birds sold/year) is expected to turn a profit of US $9,752 in year one, and US $12,590 in year three, with an IRR of 21.1% after taxes.

As mentioned above, a study of this type cannot predict the future political stability and security of southern Afghanistan. Should either diminish, a commercial broiler production facility would be much less likely to be sustainable, and profitable.

Description of the Agricultural Sector

Agriculture in Afghanistan is an important economic contributor. Agriculture employs 175 % of the Afghan labor force. In 2002, Afghanistan's GDP was $ 4.05 billion, with 51% attributed to agriculture. Land is readily available with over 8 million hectares (17.6 million acres) for cultivation, with 5.3 million hectares (11.6 million acres) having the potential to be irrigated. The availability of land is very important in order to expand and sustain quality livestock and crop production. More importantly, this expansion into livestock and other crop production is necessary in order to replace the enormous poppy production fields throughout the country**.**

Afghanistan's agricultural infrastructure has been decimated by years of conflict and recently from severe drought. Because of this, there has been very little technical advancement or commercial agricultural development in Afghanistan. However, one must look at the history of the Afghan people, which dictates a strong trading ethic among their culture. Specifically, the agricultural sector in Afghanistan has a strong yet informal trade marketplace that is indicative that a viable and sustainable agricultural sector can be developed in the future.

Presently, there are no commercial feed mills in Afghanistan. Commercially processed, nutritionally balanced feed rations for the livestock and the poultry sectors is minimal to non-existent. A commercial feed mill in Afghanistan will be the catalyst in rebuilding and developing efficient poultry, dairy, sheep and beef cattle production. The commercial feed mill will also serve as a center for animal husbandry training, while simultaneously supporting commercial poultry and dairy production, sheep and beef fattening feedlots and meat processing units.

Background for Commercial Feed Mill

The effort to modernize and promote accelerated economic growth in livestock and livestock-products markets requires a solid business development approach. The objective of a commercial feed mill is to strengthen the capacity of farmers to increase production of row crops and legumes, develop nutritionally balanced feed rations, and promote the efficient use and increase of animal production inputs.[2]These inputs are necessary for nutritionally balancing feed rations that become an integral part of the commercial feed mill program. These rations will also increase production for specific livestock and poultry production markets, control production costs and maximize product competitiveness.

A key factor in this process is transforming the animal feed sector in Afghanistan into a sector that is based on the commercial production and efficient utilization of high quality, balanced rations. On the feed production side, the feed mill owner is required to provide high quality, balanced rations on a continual basis at competitive prices. For the livestock and poultry producers, they need to know how to use these rations efficiently in order to increase, not only their productivity, but also their profitability.

The profitable growing of illegal poppies in the Southwest regions as well as other areas of Afghanistan are replacing the production of quality grain, legumes, oil seeds and cotton

[1] FAO Simon Mack -Senior officer, Livestock Department

[2] Increase of Animal Production Inputs to well-balanced feed, results in higher quality, accelerated rate of gain per pound/kg and healthier animals in a more efficient and economic method. The amount needed of a nutritionally balanced feed ration is significantly less (minimum 25-35%+) than a lower quality feed ration.

production that can be used in livestock feeding operations, flour milling, oilseed production and cotton milling operations. The Commercial Feed Mill will be a major industry that will help develop these sectors in order to compete against the growing of the illegal poppy market. The feed mill will be able to utilize the by-products from the oil, cotton, and flour milling sectors along with whole grain production of corn, wheat, barley and grain sorghum. Additionally, the importance of providing programs to rehabilitate the Cotton Mill in Lashkar Gah, oil seed production and processing of legumes will be a great assistance to the feed mill. Moreover, the feed mill will also be able to provide strong price support for these goods that will benefit the small, medium and large producer.

Market Demand for Commercial Livestock Feed

- There are no commercial feed mills operating in Afghanistan. Additionally, there is no production of a nutritionally balanced feed ration marketed for the livestock and poultry producers in Afghanistan.
- Livestock represents a capital reserve for farm households throughout Afghanistan. The latest livestock population census in 2003 – 2004, shows there are[3]12.2 million poultry, [4]8.7 million sheep, 7.3 million goats 3.7 million cattle, 180,000 camels and 140,000 horses throughout Afghanistan.
- According to recent reports from Mercy Corp over the last three years livestock numbers have rebounded throughout Afghanistan. This growth has been attributed to an increased level of economic and political stability. Moreover, this growth has and will increase the demand for quality feed to be made available for the livestock and poultry producers in Afghanistan.

Five Northern Provinces that are Increasing in Livestock and Poultry Numbers:

Population	Kunduz	Balkh	Baghlan	Saripul	Samangan	Total
Poultry[5]	235,551	287,895	280,234	124,831	118,862	1,047,373
Sheep	328,231	479,323	332,665	240,893	323,416	1,704,452
Goats	49,462	147,483	236,127	85,822	124,377	643,271
Cows[6]	157,888	74,976	168,170	63,187	42,121	506,342

Provinces of Note: The Northeast province of Badakhshan has over 300,000 cows and over 400,000 head of sheep. The Northeast province of Nangarhar – city of Jalalabad (borders Pakistan) has over 1,000,000 poultry.

Five Southwestern Provinces that are Increasing in Livestock and Poultry Numbers:

Population	[7]Halmand	Kandahar	Zabul	Numroz	Urozgan	Total
Poultry[8]	850,020	579,870	290,467	136,657	656,214	2,513,228

[3] Study carried out by Afghanistan Ministry of Agriculture and the UNFAO in 2003 (post drought years)
[4] This represents about ½ of the sheep population survey taken in 1998. Prior to the severe drought years from 1999 – 2001 – Ramp report Agriculture in Afghanistan
[5] The poultry numbers represents small family flocks of 4-12 birds per family
[6] Cows represent both dairy/ beef sector of the livestock production units
[7] The FAO Livestock Census Field Data Report 2003/2004
[8] The poultry numbers represents small family flocks of 4-12 birds per family

Sheep	596,074	605,409	161,951	65,978	362,503	1,791,915
Goats	583,178	390,156	154,151	126,657	332,365	1,446,094
Cows	184,866	70,286	34,295	11,448	229,956	530,851

Western Region: The Western Region has one province, Hirat. Hirat represents a major trade route with the Southwest provinces, which join together to sell live sheep, goats and cattle into Iran.

Hirat's Livestock Population:

	Population
Poultry[9]	691,101
Sheep	790,708
Goats	696,894
Cows	185,785

The livestock and poultry populations in the above selected towns represent the leading agricultural provinces in Afghanistan and illustrate, through high animal concentrations, the need for a commercial grade feed mill. Within these provinces the majority of Afghani livestock producers and traders understand the importance of good nutritional feed to maintain and fatten their stock. However, the lack of and infrequency of availability, the black market, price and quality of imported feedstock has fractured the livestock feed industry.

Based upon current assessed agricultural needs throughout Afghanistan, the commercial feed mill's primary objective will be to produce and supply a nutritionally balanced feed ration. This ration will then be distributed to: 1. Ewes and lamb fattening, 2. Poultry broiler and layer feeds; and 3. Dairy/beef supplement rations.

Since the 1998 FAO census, livestock numbers per family has decreased considerably as reflected in the 2003 census. Poultry in 1998 went from 6.8birds/family to 4.0 birds/family in 2003. Sheep went from 14.2 head/family to 2.88 head/family and cattle from 2.51 head/family to 1.22head/family in 2003. The largest contributing factor to this decline is the drought from 1999 through 2002, which ultimately decimated the major livestock productions areas of Afghanistan.

Pakistan over the past three years has had a growth of poultry consumption to over 138% from 1992-2004 (Mutton and beef demand decreased due to higher price). In that same period Iran had a 59% increase. This is a good indication that the trend for poultry consumption will increase in Afghanistan. Moreover, this demand could potentially offer excellent export opportunities for poultry producers in Afghanistan if they have a successfully viable commercial feed mill available to support production.

I. Identifying Commercial Feed Mill Optimum Location

The location of a feed mill is extremely important and requires many key factors that must be present in order to provide the necessary support. The area identified for the first commercial feed mill will be located in the province of Hilmand in the town of Lashkar Gah within the new Industrial Park area. The Commercial feed mill is designed for 8 MT –14 MT. per hour of mash feeds. The feed mill has been designed to expand into pelleting, bagging and grinding capacity as demand dictates.

[9] The poultry numbers represents small family flocks of 4-12 birds per family.

1. **Location Selection Criteria to Consider in order of Importance**
    a. Livestock numbers of Sheep, Poultry, Goats, Cows/dairy stock within a primary radius of 200 –250 km radius and their respective growth potential.
    b. The livestock population census is based on resident populations and only includes 30,000 nomadic Kuchi families. The Kuchi families historically winter their stock in the southwest region before driving/grazing their herds North. As the Kuchi herds rebuild, they will require feedstock during the winter season. The drought in the west and southwest caused a drastic decline in the Kuchi herds. Historically, the Kuchi's livelihood has been with livestock, hence acquiring good animal husbandry practices compared to resident farmers. For example, this year alone 80% of the Kuchi herds have been vaccinated compared to 65% of the resident livestock farmers.

2. **The Availability of Local Feed Stocks**
    a. Presently, production levels of yellow corn in the Hilmand Province and some of the bordering provinces can supply quantities to support initial and subsequent feed mill requirements. Many of the farmers are producing maize (corn) as a double crop with wheat preceding on their irrigated land. Farmers are not adequately fertilizing the corn nor utilizing new varieties of seed corn. Hence, corn yields remain below average. Wheat and other grains such as barley are also suffering from below normal yields.
    b. The feed mill will be the mechanism for developing a sustainable and profitable market for corn (maize), wheat, and other grain and oils seed crops for the local and regional farmers.

3. **Availability of Live Animal and Processed Meat Markets**
    a. Due to the large sheep production in the Hilmand area, the export market for live animals into Iran through Herat is very active. Live animal markets going north to Kabul are also active and profitable during specific times during the year.
    b. Hilmand province has the ability to supply a large processed meat market. This market extends west to Kandahar and north to Zabul and further north to Kabul.

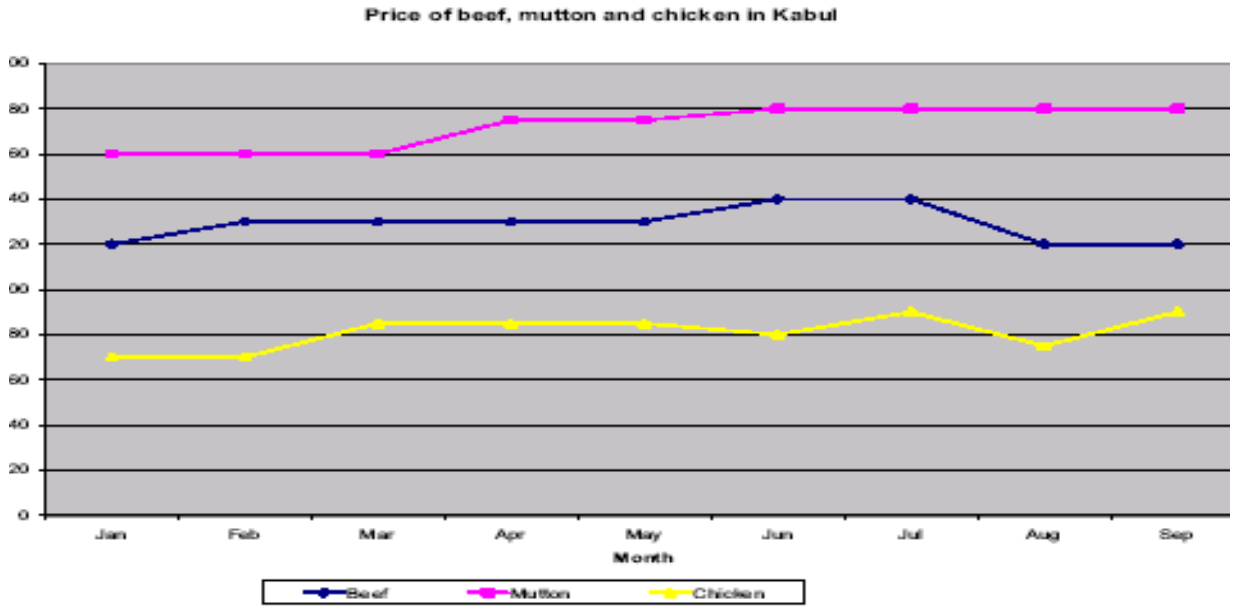
The Chart below Represents the Average Retail Price for Meat and Poultry.

RETAIL LIVESTOCK AND POULTRY MARKET PRICE

FAO Report -2005

Region	Beef	Mutton	Chickens
South West – Kandahar, Helmand, Zabul, Nimroz, Uruzgan,	**$ 2.69/kg. 132 Afs/kg.**	**$ 3.89/kg. 191 Afs/kg.**	**$ 1.65 81 Afs/kg.**
West – Hirat, Farah, Badghis, Ghor, Bamyan	**$ 2.55/kg. 125 Afs/kg.**	**$ 3.32/kg. 163 Afs/kg.**	**$ 1.87/kg. 92 Afs/kg.**
Central – Kabul, Parwan, Kapisa, Logar, Wardak,	**$ 2.68/kg. 132 Afs/kg.**	**$ 3.63/kg. 178 Afs/kg.**	**$ 1.73/kg. 85 Afs/kg.**
North & North East – Faryah, Juzjan, Sar-I-pui, Balkh, Samangan, Baghlan, Kunduz, Takhar, Badakhshan	**$ 2.81/kg. 138 Afs/kg.**	**$ 3.41/kg. 168 Afs/kg.**	**$ 1.77/kg. 87 Afs/kg.**

The live market price for Sheep will range from 3,000 Afs ($66.00) to 6,500 Afs ($143.00) from July – September and during specific Holy Days.



4. **Roads and Transportation Availability**
   a. Primary and secondary roads within 200 –250 kms are not in good condition causing higher than normal transportation costs.
   b. However visiting with truck drivers (5 – 15MT capacity trucks) explained that they covered more area than road conditions would indicate. They also had developed informal gathering stations for wheat, corn and alfalfa hay at several of the more remote location from Lashkargah.

Freight costs from Lashkar Gah to Proposed Distribution Sites

(The rate prepared by a local transportation agency – January 26, 2006)

Chart 1: Demonstrates the type of truck and average cost of freight for regional villages within the Hilmand provinces that the feed mill will service.

No	Name of trucks	Costs				Load Limit MT.	Road Condition
		Kandahar	Kabul	Nimroz	Herat		
1	Mazda truck (small truck)	4500 Afs ($ 99.00)	18000 Afs ($396.00)	Not going	Not going	5 Mt	Asphalt
2	Hino Truck 6 bolts	7500 Afs ($ 165.00)	25000 Afs ($ 550.00)	15000 Afs ($330.00)	15000 Afs ($ 330.00)	10 Mt	Asphalt
3	Mercedes Truck 10 tires	14000 Afs ($ 308.00)	50000 Afs ($ 1,100.00)	20000 Afs ($ 440.00)	20000 Afs ($440.00)	24 – 30 Mt.	Asphalt
4	Hino 8 bolts trucks	10000 Afs ($ 220.00)	30000 Afs ($ 660.00)	18000 Afs ($396.00)	18000 Afs ($396.00)	15 Mt	Asphalt
5	Trailer 18 Tires	28000 Afs ($616.00)	700000 Afs ($15,400.00)	500000 Afs ($11,000.00)	50000 Afs ($1,100.00)	60- 80 Mt	Asphalt
6	Refrigerated truck	7000 Afs ($ 154.00)	20000 Afs ($440.00)	15000 Afs ($330.00)	15000 Afs ($ 330.00)	2 Mt	Dirt road & Asphalt.
7	Boldek Border to		Quetta Pakistan				
8	Quetta to Lashkargah 27,000 AF ($ 594.00)		7000 Rs ($ 117.00)				

Information provided by: Dr. Fazel Elahi – Translator ALP/S Lashkar Gah

Transportation Cost HinoTrucks to districts in Hilmand Province from Lashkar Gah

Chart 2: Demonstrates the type of truck and average cost of freight for local villages within the Hilmand Provinces that the feed mill will service.

Lashkar Gah To	Snagin - 6000 Rs = $ 100.00	85 km.
Lashkar Gah To	Kajaki – 6500 Rs = $ 109.00	125 km.
Lashkar Gah To	Musa Qala – 5000Rs = $ 84.00	120 km.
Lashkar Gah To	Marja – 1500 – 2000 R. = $ 25-33.00	36 km.
Lashkar Gah To	Now Zad – 4500 Rs = $ 75.00	107 km.
Lashkar Gah To	Garem Ser – 6000 Rs = $ 100.00	80 km.
Lashkar Gah To	Washer – 6000 afs = $ 132.00	120 km.
Lashkar Gah To	Greshk - 1500 Rs = $ 25.00	48 km.
Lashkar Gah To	Nawa – 2000 –3000Rs = $ 42.00	26 km.

Fuel Cost: [10]Petrol 30 Afs./liter = $ .66¢/liter = $ 2.50/gallon
Diesel 30 Afs./liter = $ .66¢/liter = $ 2.50/gallon.

New Truck Pricing

Chart 3: Provides a price indication on purchasing new trucks in Afghanistan.

Type of Trucks	Total Cost including Documents
Mazda 3500 (Small)	450,000 Rs. = $ 7,525.00
Hino Truck – 6 bolts	600,000 Rs. = $ 10,033.00
Mercedes Truck –10 tires.	1,250,000 Rs. = $ 20,902.00
Hino Truck – 8 Bolts	860,000 Rs. = $ 14,381.00
Russian Truck – 6 wheel	600,000 Rs. = $ 10,033.00

NOTE 1: The above freight costs depend on fuel costs and climate (fluctuating price). It also depends on how many times the truck is stopped to pay a tariff (shake down) for transporting goods throughout Afghanistan.

NOTE 2: Afghanistan Trucks are not allowed to go inside of Iran; only selected fuel tankers can cross the border.

[10] Petrol will be higher in the summer months.

5. **Availability of Electrical Power**
    a. The approval of upgrading the electrical substation near Lashkar Gah will have a major impact on establishing the commercial feed mill in this area along with several of the supporting agribusinesses such as a poultry processing unit and dairy processing facility.
    b. The feed mill does not have a high power requirement, but requires a dependable and consistent supply. The new/proposed upgrade of an electrical substation near Lashkar Gah will provide the necessary primary power.
    c. This plant will have a stand-by generator to serve as a secondary/back-up power supply only.

6. **Technical Labor Force**
    a. Requirements for operating the feed mill will be a General manager/operation manager, one comptroller and one mill manager. Three to four well-trained technicians will support the management team. These technicians should possess strong mechanical aptitudes in their specific areas of responsibility. Those areas include: 1) Grain Storage and handling facility, 2) Bulk and bag receiving areas for grain, feed by-products, and vitamin/minerals, 3) Hammer milling sector and Mixing area, and 4) Bagging and Warehousing
    b. General labor personnel will support each one of these areas. Each area would have a minimum of two laborers with the exception of the bagging and warehousing sector, which would have six to eight general laborers.

7. **Marketing /Training program**
    a. The marketing program must have four well-trained feed technicians that are not only technically strong but also strong in sales and marketing. They will be required to set up the feed demonstration units for the different sectors of livestock, provide extension type training to livestock producers, organize workshops for livestock producers and potential feed distributors throughout Afghanistan.
    b. The trained feed technicians will also work with select groups and existing organizations in training and distribution. They will assist in setting up company owned feed distributors in strategic locations within the marketing grid. See Distribution Map.
    c. Feed technicians will also be responsible for working with outlets and other successful agricultural distributors of seed and chemicals.

II. Identifying the Competition for a Commercial Feed Mill in the Region

The area located from the eastern border of Afghanistan into Pakistan will provide competition on low-quality and commercially prepared feed rations. The majority of “complete feed rations” being imported from Pakistan are part of an import package that includes broilers and layer chicks coming into Afghanistan (i.e. if you purchase 500 chicks, feed is then included in the package price – import package).

1. **Personal Observations of Note on Imported Agricultural Goods into Afghanistan:**
    a. Personal visit to a site that had purchased day-old chicks from Pakistan. These birds were 17 days and had over 15% death loss because the chicks were in bad

condition both genetically and nutritionally. The feed was very coarse, fibrous, and had an off-odor of a sour feed.

b. Day old chicks from Pakistan range from 15- 25 RS (.25¢ to .42¢/chick). For example, the facility's original order of 12,000 day old chicks at a 15% death loss within the first 17 days resulted in a loss of $756.00 (37,000Afs.) or at .34¢/chick the loss would be $612.00 (30,000 Afs).
c. These exceptionally high losses are attributed to: a) poor genetics b) low quality feed; and c) poor management (animal husbandry practices including improper/ poor quality medications.)
d. Pakistan's exported vegetable proteins, such as Soybean meal, Cottonseed meal, and Sunflower meals are low in quality and have no certification of the product's nutritional value.
e. Majority of these products are trucked from Pakistan through a black market. Therefore, the quality and disease contamination goes unchecked.
f. Much of the animal and poultry medications come from China, India, Pakistan and some regions of Iran. A majority of these goods are outdated, discontinued or of inferior quality being dumped into Afghanistan.
    - A majority of the agricultural goods are from Pakistan enter the country via truck through the Pakistani black market trade.
    - Tariff and transportation cost will make up 25 % to 30 % of the transportation costs of agricultural goods coming into Afghanistan from the bordering countries. For example: A complete broiler feed will cost $ 235.00 / MT at the border of Pakistan. From the Pakistani border into final destination in Afghanistan, there will be additional transportation costs "fees" of $ 58.00 to $ 60.00 / MT for the goods to ensure safe arrival.

g. The cost of vegetable proteins (low quality) from bordering countries of Afghanistan is high due to transportation costs. Availability and quality of these products are very erratic. Additionally, Afghanistan's livestock and poultry producers are very distrustful regarding these supplies coming in from Pakistan, Iran, Turkmenistan, Uzbekistan, and Tajikistan. These producers try to identify and work with a relative or brother in one of these countries, as they are more confident they will actually receive the goods although they still realize the quality is poor.

III. Infrastructure /Transportation and Storage Facilities for Feed Stock Commodities in Hilmand and Surrounding Region

a. Semi-arid conditions exist in the Hilmand and Kandahar region where irrigation plays an important role in developing crops. Unfortunately, many of the irrigation systems have been damaged or are in disrepair due to a lack of maintenance. This has created a decline in production that has ultimately resulted in higher locally priced commodities compared to bordering countries.
    - Road conditions throughout Afghanistan are in poor condition resulting in higher than normal shrink (loss) on commodities delivered into the urban centers, Lashkar Gah and Kandahar.

- Wheat, Barley and Yellow corn coming from the rural production areas into the urban market of Afghanistan will have a 15 –20% shrink (loss) just in transportation alone due to road conditions.

b. Security is the other major factor for high cost of agricultural goods within Afghanistan.
c. A grain storage facility will be part of the commercial feed mill. The storage facility will have over 8400 metric tons of basic bulk feed grain storage and two drying/ storage tanks to receive and maintain feed grain at proper moisture levels. Additionally, the grain storage facility will include a warehouse for bagged commercial feed ingredients and for finished bagged livestock feed. The capacity is based on a six-month supply of feed grains milling to formulate nutritionally balanced livestock and poultry feed. The storage is based on turning over the facility only twice a year, but will have the capability of at least four-six times a year based on feed mills volume and availability of feedstock. Appendix 2 of this report has the basic layout including a complete equipment list and estimated cost for configuration.

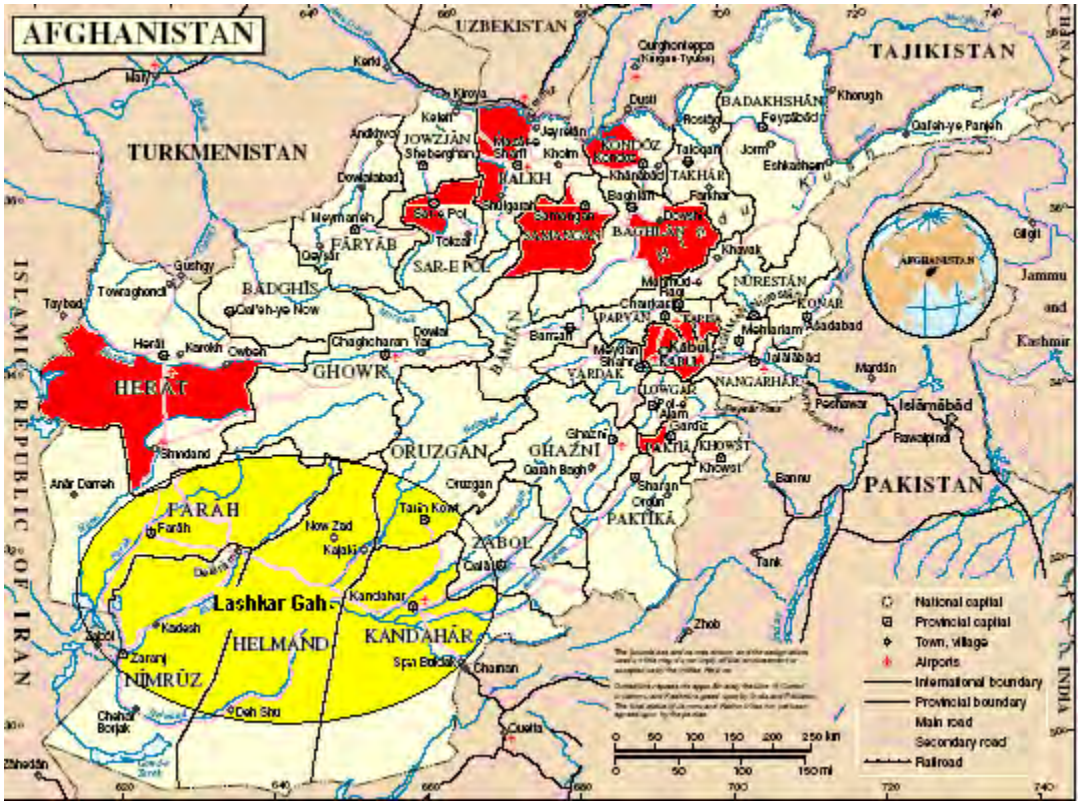
IV. Commercial Feed Mill Feed Distribution Network

a. The commercial feed mill will be the agricultural center for livestock and poultry production for Afghanistan's major agricultural areas.
b. Distributors will be set up in key towns, such as Kandahar, Kabul, Herat, Kanduz, Mazah Sharif, Samagan, Baghlan, Ghazini, Tirin Kat and Qalat.
c. The distribution system will be organized utilizing already existing privately owned veterinarian distributions center. These centers can economically warehouse and distribute feed supplements for dairy and beef cattle, complete poultry feeds, and finishing feeds for lamb fattening programs.
d. There are areas of major livestock concentration in the following provinces, Hilmand – Kandahar - Kunduz, Baglan and Balix and Saripul.

The proposed Commercial Feed Mill has an operating production capacity of 112 MT/ per 8 hour shift. by adding a second shift the production capacity will increase to 224 MT/day of balanced feed rations.

- The Southwest Region of Afghanistan consisting of Hilmand, Kandahar, Zabul, Nimroz and Uruzhan has a potential demand of 377 MT / day at 5 % of the total livestock and poultry population based on the 2003 FAO report .
- The Northern Region consisting of Faryah, Juzjan, Sar-I-pul, Balkh, Samangan, Baghlan, Ku duz, Takhar and Badakhsan has potential demand of 357 MT/day at 5 % of the total livestock and poultry census.
- The mill will have the capability of meeting this demand through production scheduling and inventory control.
- As the demand increases the mill is designed to insert an additional hammer mill, mixer and bagging line to be added economically with out disrupting the existing plant production system.

The map below highlights the specific areas the feed mill will cover.



MAP KEY:
Yellow – Primary feed mill location and feed distribution
Red – Distribution areas for feed mill. *Note:* Feed mill distribution centers can be owned exclusively by the feed mill or through licensed distributors.

V. Sheep Industry in Support of the Feed Mill

The sheep industry in Afghanistan is very strong as the rate of mutton consumed is very high. Referring to the retail meat chart, one can see mutton will represent a very good rate of return under a structured and balanced feed ration program that will be made available through the proposed commercial feed mill.

A sheep feeding demonstration unit that is part of the commercial feed mill would provide a much needed extension service for the area.

a. Setting up a feeding unit for ewes prior to breeding "flush feeding" program would increase first time conception rates of over 30 - 35 % compared to the local numbers in Afghanistan. This program would also incorporate a vaccination program.
b. The feeding of the pregnant ewes through lambing and weaning will decrease current lambing death rates by 15 % - 20 % in Afghanistan. Utilizing sound animal husbandry practices along with a well-balanced and economical feed rations from the mill will increase the live birth rate of 100 ewes by 10-12 lambs.

VI. A Lamb Finishing Fattening Unit - An Excellent Investment

A lamb finishing and fattening unit will provide excellent investment opportunities as well as utilizing the balanced rations from the feed mill. For example, the price of fat lambs is very good throughout Afghanistan; therefore a lamb fattening operation would provide an excellent return on the investment. A program for financing these operations should be made available for the producers.

a. Setting up a lamb feeding unit is relative inexpensive and simple in design. The basic unit would have a gable roof /pole barn style with an open – front with a sloping packed dirt confinement lot. The self-feeders and water are place in a protected area, concrete pad with good ventilation. In the Southern area of Afghanistan roof must be provided to reduce summer heat load. Appendix 2 will have the sheep rations, lamb feeding layouts and listing of equipment necessary for the feedlot.

Note: Reference Appendix 2 for additional fat-lambing project information

VII. Poultry

Poultry production in Afghanistan is very fragmented with family size flocks of 12 to 25 birds per family. Recently in the north-central part of Afghanistan there are some larger hi-density broiler production of 12,000 to 20,000 birds per house coming on-line. One of the major constraints to this growth is the lack of hatcheries located in Afghanistan. There are several incubators in the Kabul area, but these are not being utilized because of mismanagement and competition from day-old chicks from Pakistan. As the broiler and layer markets increase the demand for locally hatched stock will equally develop. There are several well-trained poultry technicians that have expressed interest and are vigorously looking to invest in incubators.

Note: Appendix 3 illustrates a project for a 5,000 bird broiler operation has been broken down to illustrate the profitability of this endeavor.

VIII. Clarifying Activities for the Commercial Feed Mill

Commercial Feed Mill activities that should be required include but are not limited to:

a. Develop and require training for feed mill personnel in business development, management, feed formulation capacity and the management/inventory of raw material
b. Develop training programs for producers to educate and promote production and animal husbandry skills
c. Provide technical assistance for the development of product quality standards and their monitoring in the marketplaces in collaboration with public, private institutions and NGO's.
d. Develop and disseminate information related to the availability of animal feed and feeding techniques. The communications goal would be to reach a large audience of producers through feed demonstration units that are strategically located throughout the major livestock producing areas. Utilizing radio and television networks as well as other outreach communication programs to not

only educate producers but also to generate awareness about the feed mill and its operations.

e. Promote and strengthen partnerships between private feed producers and local financial institutions. These partnerships can provide support for the development and implementation of business plans and facilitates dialogue between private operators and public sector authorities regarding the regulatory and policy issues that may affect the feed mill's operations.
f. Organize and facilitating the creation of professional agricultural producer groups such as the: Poultry Growers Association, The Sheep Growers Association, etc. These groups will be part of the feed mill network and will also serve as an advocate for livestock and poultry feed producers. This type of support is critical for the feed mill's success.
g. Generate higher rates of return for producers. For example, the feed mill will provide greater financial return for the livestock producers providing a higher rate of gain in less time than the Afghans livestock producers are currently doing. The meat will be more tender, edible and to the palate. Refer to the appendices for supporting documentation. This type of increase/benefit can also be realized within other animal sectors such as poultry, dairy, beef and lambs.

IX. Measures of Success for the Commercial Feed Mill Activities Include, But Not Limited to:

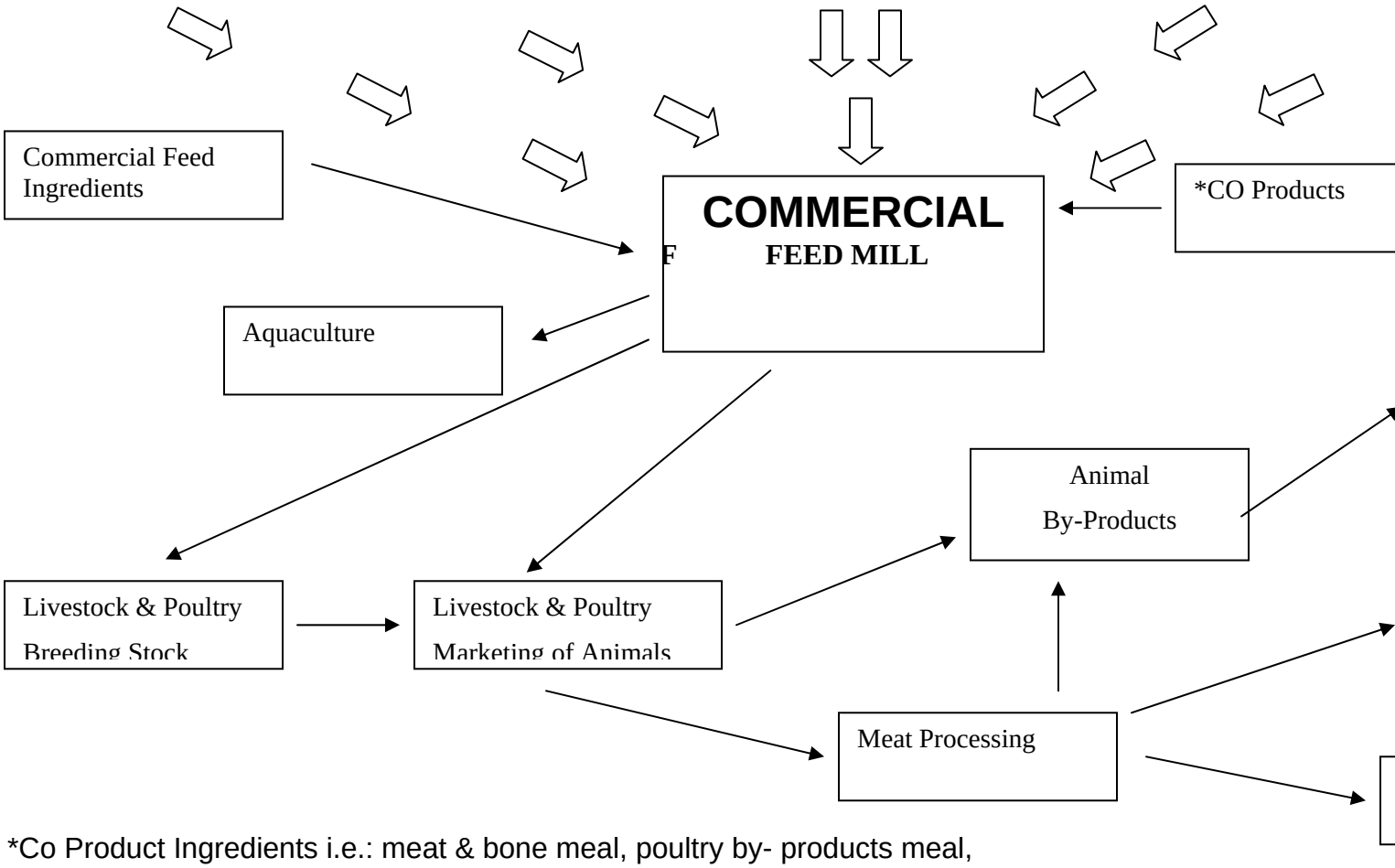
a. Volume of quality animal feed produced and utilized
b. Number of business plans developed and submitted and approved by financial institutions
c. Number of policy issues advocated. For example, feed tag (ingredient analysis) certification for all commercial feeds domestic and imported
d. Number of producers who have access to quality feed
e. Number of sustainable livestock and poultry feed enterprises created
f. Number of AI (Artificial Insemination) programs for herd improvement in dairy, sheep, beef cattle and goats
g. Number of incubators/hatchery's coming on-line for poultry sector

X. Conclusions

The key issue to a successful feed mill is to understand the need to produce standard, high quality, balanced rations. In practice, such rations are entirely new products in an unstructured Afghanistan feed sector. There are no norms or standards applied or enforced. Developing a commercially viable animal feed sub-sector requires an increasing demand from producers who are capable of monitoring production costs and applying good business and animal husbandry practices in the management of their production activities. The basic elements of such a program include: 1) Application of basic regulatory measures to control the quality of major feed ingredients and blended feeds sold in domestic markets; 2) Technical and business development support for feed producers; and 3) Extension and training for livestock producers in improved feeding and on-farm management practices.

AGRICULTURE FLOW CHART

Row Crops	Oil Seeds	Horticulture	Legumes	Greenhouse Products
Maize, Wheat, Barley, Grain Sorghum, Cotton	Linseed, Canola, Soybeans, Sunflowers		Alfalfa, Clover, Grasses	



*Co Product Ingredients i.e.: meat & bone meal, poultry by- products meal, feather meal, fish meal, flash dried blood meal

Note: Not all agricultural sectors represented. Only those sectors specific to Afghanistan's needs are

APPENDIX I

THE FEED MILL

A. The Feed Mill consists of (9) 30 MT holding bins and (5) – 15 MT holding bins complete with a head house and structural steel. A warehouse will need to be attached to the mill and provided by the potential mill owner. There will be an 8,400 MT grain storage facility that will provide storage for corn (maize), wheat, barley and grain sorghum as basic grains for the feed mill.

The 8 – 14 MT per hour feed mill is made up of eight activities/sectors required to efficiently produce an accurately balanced livestock and poultry ration.

1. **The Receiving System**
    a. All feed grains and feed ingredients will be weighed and received in bulk or bagged at the truck-receiving hopper. A majority of the bulk feed grains, corn, wheat, and or barley will flow through a gravity grain cleaner (scalper) and then distributed to the 8,400 MT grain storage facility. Feed ingredients, such cottonseed meal, soybean meal, wheat bran, ground limestone, fishmeal will be distributed to the designated hopper bottom tanks within the feed mill. All of the tanks have level sensors to regulate the filling and prevent distributing product into the wrong tank.

2. **Grinding System**
    a. The overhead tanks equipped with level sensor and slide gates with solenoid valve automatic operating with 2 limit switches for each gate. A surge hopper above the hammer mill with electronic probe and rotary feeder to keep flow of product consistent. All products flow over a magnet before discharging into the 9 MT per hour hammer mill that is equipped with air filter and fan/cyclone dust control system The ground feed grains are then distribute at 12 MT/ hour capacity to overhead tanks.

3. **Batching System**
    a. The batching system is completely automated with gates, augers, conveyors, scale and scale hopper and slide gates. For example, feed grains, such as ground corn, will flow at a precisely measured volume along with other measured ingredients into the 128 cubic foot (1.5 MT) horizontal ribbon type mixer with surge hopper and capacity of 22.5 MT/hour.

***Hand Add Platform:** The “hand add” platform allows you to add high-valued product, if needed, at any measured volume into the batching system.

4. **Micro Ingredient Batching System**
    a. The micro-ingredient system is comprised of 16 stainless steel bins and is operated by an electronic control unit with a programmable controller and variable frequency motor drive. This unit offers a precise conveyor speed in order to maximize the batching accuracy of the micro system. The individual bins can

be removed from the system allowing for ease of inventory for the high value micronutrients, vitamins, minerals and medicine.

5. **Liquid Addition System**
   - **a.** A 3,400 gallon heated tank for liquid fat to be added into rations for high energy requirements. This unit is completely automated with level sensors, check valves and a mass flow metering system to ensure accurate injection of liquid fat into the rations. The system comes complete with piping, filters and pump.

6. **Bagging System**
   - a. The nutritionally balanced feed ration is discharged from the batching and mixing system and distributed at 25 MT per hour to (4) –12 MT capacity overhead holding bins that will feed into the bagging system. The bagging system has a surge hopper with level sensors and air operated slide gates. A weighing system with a bag sewing head that will handle (4) - 50 kg bags per minute – for 3,000 kg., per hour capacity. A conveyor will then move the bags into waiting handcarts for bags to be stored in the warehouse for distribution.

7. **Automated Control System and Motor Control Center**
   - a. The automated control system is set up to accept a computerized ration. In turn the automated control system will properly set all the controls automatically in the batching system sector. Also provides access to manual controls to all other sections of the plant. The operation of this automated control system will require one trained technician.

B. FEED MILL MANUFACTURING SPREADSHEETS

The details of financial assumptions for livestock feed and calculation of project and profitability have been given as under.

FINANCIAL Analysis Assumptions – Livestock Feed Mill

5.1 ASSUMPTIONS :

5.1.1 The cost of land and site development is included in the financials analysis, with the assumption that two hectares of land will be needed in total. Cost of land and site development is assumed at US $64,650, (per information gathered by consultant Mark LaGrange in Lashkargah).

5.1.2 The cost of the building itself is derived from local prices. General construction cost is assumed at US $581,121, which includes buildings, storage, etc.

5.1.3 The complete plant and machinery will be purchases from a reputed company, which will construct the plant and provide it to project investors on a turn-key basis. Plant capacity will be 14 tons/hour, of livestock feed. The cost of plant and machinery transportation, and installation, has been provided by the supplier at US $1,632,000.

5.1.4 Cost estimates for miscellaneous fixed assets are based on prevailing prices, and set at a total of US $107,000.

5.1.5 Cost contingencies for the project are assumed at 5% of total project cost, and estimated at US $129,539.

5.1.6 Pre-operative and preliminary project expenses are included, which include travel for plant and machinery inspection, and other similar costs, for a total of US $206,000.

5.1.7 Assumptions regarding livestock feed production and product mix are as follows (per LaGrange):

Sr. No.	Particulars	Years		
		1st	2nd	3rd
1.	Installed Capacity (MT/Hour)	14	14	14
2.	Capacity Utilisation (%)	70	80	90
3.	Number of Days of Production	280	280	280
4.	Operating Hours/Day	8	8	8
5.	Feed Produced Tons/Year	21,952	25,088	28,224

5.1.4 Raw material needs of the plant are as follows. (Percentages provided by LaGrange, and price/ton are spot market prices in Lashkargah).

Ingredients	**%**	**Price US $/Ton**
Wheat Bran	25	100.00
Corn	30	130.00
Cotton Seed Oil Cake	25	320.00
Pulses Skin, Powder, etc.	10	80.00
Other Oil Cakes	8	200.00
Minerals	2	850.00

5.1.5 Expected product-sales price per ton are as follows (rate per LaGrange; at 50 afs/1 USD):

No.	Components	US $ /Ton	Afs Price./Ton
1.	Compounded Livestock Feed	300.00	15,000
2.	Compounded Poultry Feed	320.00	16,000

5.1.6 Cost of consumables (lubricating oils for equipment maintenance, etc.) is assumed at US $1,000/ton of feed; plus twenty 50 kg gunny sacks/ton, at a cost of US $0.30/sack.

5.1.7 Salaries and wages shown are the same as those found in the Lashkargah private sector, with an assumption of 5% wage increase per year. Total direct employment assumed is 47 production workers, plus 18 employees in sales and administration.

5.1.8 Utility requirements and its costs are based on prevailing market prices. Assumptions are that 250 kw will be required for the plant's operations. Expectations are that 50% of the power will be available from public electricity, and 50% generated by the facility with a generator. Cost of fuel is assumed at US $0.60/liter (market price at present), and US $0.20/KWH. (Please note that this figure is adjusted for expected price increases. Present public utility cost for manufacturing in Lashkargah is US $0.12/KWH.)

5.1.9 Miscellaneous manufacturing costs, such as annual repairs and maintenance, are set at 5% of the costs of buildings and machinery. Advertising costs are set at 1% of projected annual sales.

5.1.10 Interest rate of borrowed funds is assumed at 18%, which is the high end of that provided by the Afghanistan International Bank, the primary source of such credit in Afghanistan. Repayment is set at one payment per every six months, over nine years, with a moratorium of one year for construction and machinery loans.

5.1.11 Working capital calculations are based on the availability of raw materials and storage, as a function of the marketing cycle. For calculation purposes, one month corresponds to 25 work days, and two weeks to 12.5 workdays.

Line Items	No. of Days
Indigenous Materials	150
Consumables	50
Packing materials (sacks)	50
Finished Goods Stock	12.50
Work-In-Progress (WIP)	2
Book Debts	12.50
Operating Expenses	25

As mentioned previously, the interest rate on working capital is assumed at 18%.

5.1.12 To calculate the payback period, the depreciation method used is Straight Line Method (SLM). However, the "Written Down Value" (WDV) method is used for taxation and calculating financial projections.

5.1.13 Taxes are assumed as 10%, per present Afghan law.

5.2 COST OF PROJECT AND MEANS OF FINANCING :

5.2.1 Total project cost for establishing a feed mill in Helmand province is estimated at US $3,593,528. A summary of project costs are as follows:

Schedule - A

	Particulars	**$**	**Afs.**
a)	Land and Site Development	64,650	3,232,500
b)	Buildings and Civil Works	581,121	29,056,040
c)	Plant and Machinery (Imported)	1,632,000	81,600,000
d)	Miscellaneous Fixed Assets	107,000	5,350,000
e)	Preliminary and Preoperative Expenses	206,000	10,300,000
f)	Provision for Contingencies	129,539	6,476,927
h)	Margin Money for Working Capital	873,218	43,660,900
	Total	**3,593,528**	**179,676,367**

5.2.2 Means of Financing :

Finance assumptions are that the investor will contribute 50% of project start-up costs, with the balance financed from financial institutions, per the following:

#	Sources	US $	Afs.
1	Entrepreneur – 50%	1,796,764	89,838,175

2	Bank Funds – 50%	1,796,764	89,838,175
	Total Finance	**3,593,528**	**179,676,350**

5.3 PROJECTED FINANCIAL STATEMENTS :

5.3.1 **Projected Profitability:** (Schedule – B)

Project profitability is as follows:

(Amt. in US $)

No.	Financial Measurements	1st year	2nd year	3rd year
1	***Sales Income***	6,461,338	7,618,337	8,574,146
2	Cost of Production Incl. Tax	5,68,968	6,622,366	7,378,996
3	Profit (PAT)	812,370	995,971	1,195,150

5.3.2 Please note from the financial tables included in the analysis that cash flows increase from US $181,391 in year one, to US $1,273,316 in year five of operations. Cash accruals increase from US $1,054,609 in year one, to US $5,605,172 in year five of operations.

5.3.3 Please note from the balance sheet that net current assets increases from US $3,965,336 in year one, to US $9,361,610 in year five of operations. (per Schedule – E)

5.3.4 **Important Ratios:** (Schedule – F)

The financial projections for a feed mill below indicate the following financial parameters, in year two of operations.

1. EBIT to Capital Employed %	27.33
2. Return on Investment	
i) PBT to Capital Employed %	14.37
ii) PAT to Capital Employed %	13.21
iii) PBT to Net Worth %	30.04
iv) PAT to Net Worth %	27.63
3. Gross Profit PBT to Sales %	14.22
4. Raw Materials Cost to Sales %	65.57
5. Operating Ratio % (Net income/ Prodn. Cost)	72.96
6. Interest Coverage Ratio	2.80
7. Fixed Assets Turnover Ratio	3.35
8. Debt Equity Ratio	0.44
9.Current Ratio	2.27
10. Ratio of N/W + L/T Liabilities to Fixed Assets	2.28

Legend:

- PBT: Profit Before Taxes
- PAT: Profit After Taxes
- EBIT: Earnings Before Interest and Taxes
- NW: Net Worth

- L/T: Long Term

5.3.5 Break Even Point – (Schedule – G): The break even point (BEP) for a proposed livestock feed unit is 43% of installed capacity, and 62% of utilized capacity. The BEP decreases to 41% of installed capacity, and 46% of utilized capacity in the fifth year of operations.

5.3.6 **Sensitivity Analysis:** (Schedule – H)

Sensitivity analysis has been carried out regarding a potential decrease in sales revenue of up to 12.5%, and for an increase in total variable cost by 18%. The following table reflects such break even points.

Sr. No.	Parameter	BEP Utilised %	BEP Installed %
1	Sales revenue decrease by 12.5%	93	65
2	Fixed costs increase by 18%	85	59

If sales revenue decreases, or fixed costs increase beyond the percentages listed above, the viability of the project becomes questionable at 70% of utilized capacity, or below. In order to improve viability beyond these percentages, utilized capacity would have to be increased.

5.3.7 The pay back period for the project, based on financial projections, is estimated at 2 years and 3 months. (Schedule – I)

5.3.8 The Internal Rate of Return (IRR) for the project, post income tax, is 26.9%.

Based on the above assumptions, the project is feasible, and profitable.

- Equipment List -

Introduction

All of the equipment listed on the following pages has been carefully selected from the companies who are leaders in their respective fields and have unsurpassed reputations for quality, performance, reliability, service, and worldwide availability of spare parts.

From: Abel Manufacturing Company
Appleton, Wisconsin
United States of America

To: Chemonics International ALPS/S
Afghanistan

14 March 2006 Section 1

Abel Manufacturing Company
P.O. Box 757
Appleton, WI USA

Chemonics International ALPS/S

Afghanistan
14 March 2006

Receiving System

Item Number	Ext.	Abel Quan	Cust Quan	Option Quan	Description
120-010	-01	1			Truck receiving hopper
120-020	-01	1			Conveyor
	-02	1			Drag, 42 tons/hour, 20' long
120-030	-01	1			Truck receiving hopper
120-040	-01	1			Conveyor
	-02	1			Drag, 42 tons/hour, 20' long
120-050	-01	1			Magnet
	-02	1			Plate type, manual
120-060	-01	1			Elevator
	-02	1			42 tons/hour, 95' discharge height
120-070	-01	1			2-way valve
120-080	-01	1			Scalper
	-02	1			Rotary drum type, 45 tons/hour
120-090	-01	1			2-way valve
120-100	-01	1			Distributor
	-02	1			10 outlet, 10" spouts, 60 degree
120-110	-01	2			Level sensor
	-02	2			Rotary paddle type
120-120	-01	8			Level sensor
	-02	8			Rotary paddle type
120-130	-01	1			Conveyor
	-02	1			Drag, 42 tons/hour, 12' long
120-140	-01	1			Distributor
	-02	1			10 outlet, 10" spouts, 60 degree

Grinding System

Item Number	Ext.	Abel Quan	Cust Quan	Option Quan	Description
150-010	-01	2			Level sensor
	-02	2			Electronic probe type
150-020	-01	2			Gate
	-02	2			Slide gate, air operated, 18", solenoid valve and two limit switches
150-030	-01	1			Surge hopper

150-040	-01	1			Level sensor
	-02	1			Electronic probe type
150-050	-01	1			Rotary feeder
150-060	-01	1			Magnet
150-070	-01	1			Hammermill
	-02	1			9 tons/hour of #2 corn with #7 screen
	-03	1			125 HP motor
150-080	-01	1			Air filter
	-02	1			2500 CFM
150-090	-01	1			Fan
	-01	1			2500 CFM
150-100	-01	1			Conveyor
	-02	1			Screw, 15 tons/hour, 15' long
	-03	1			Air plenum
150-110	-01	1			Elevator
	-02	1			12 tons/hour, 85' discharge height
150-120	-01	1			Distributor
	-02	1			4 outlet, 10" spouts, 60 degree

Batching System

Item Number	Ext.	Abel Quan	Cust Quan	Option Quan	Description
200-010	-01			14	Level sensor
	-02			14	Electronic probe type
200-020	-01	14			Gate
	-02	14			Slide gate, manual, for maintenance
200-030	-01	14			Conveyor
	-02	14			Screw, 12" diameter, various lengths
200-040	-01	1			Scale
	-02	1			Scale hopper, cover, canvas adapter, load cells, load cell junction box
200-050	-01	1			Gate
	-02	1			Slide gate, air operated, 18", solenoid valve and two limit switches
200-060	-01	1			Mixer
	-02	1			Horizontal ribbon type, 1.5 ton (128 cubic foot), 30 HP
200-070	-01	1			Surge hopper
	-02	1			1.5 ton (88 cubic foot)
200-080	-01	1			Level sensor
	-02	1			Diaphragm type
200-090	-01	1			Conveyor
	-02	1			Drag, 25 tons/hour, 12' long
200-110	-01	1			Elevator
	-02	1			25 tons/hour, 100' discharge height
200-120	-01	1			Distributor
	-02	1			6 outlet, 10" spouts, 60 degree
200-130	-01	4			Level sensor
	-02	4			Rotary paddle type

Hand Add System

Item Number	Ext.	Abel Quan	Cust Quan	Option Quan	Description
220-010	-01	1			Receiving hopper
220-020	-01	1			Gate
	-02	1			Slide gate, air operated, 12", solenoid valve and two limit switches

Micro Ingredient Batching System

Item Number	Ext.	Abel Quan	Cust Quan	Option Quan	Description
240-010	-01	1		1	Micro ingredient batching system
					16 bins
240-020	-01	1			Conveyor
	-02	1			Drag, 25 tons/hour, 18' long, stainless steel

Liquid Addition System

Item Number	Ext.	Abel Quan	Cust Quan	Option Quan	Description
260-010	-01	1			Valve, manual
260-020	-01	1			Filter
260-030	-01	1			Valve, check
260-040	-01	1			Valve, manual
260-050	-01	1			Piping, fill pipe
260-060	-01	1			Tank
	-02	1			3,400 gallon, carbon steel, heated
260-070	-01	2			Level sensor
	-02	2			Electronic probe type
260-080	-01	2			Valve, manual
260-090	-01	1			Filter
260-100	-01	1			Pump
	-02	1			25 gallons per minute, cast iron
260-110	-01	1			Valve, check
260-120	-01	1			Meter
	-02	1			Mass flow type, high accuracy
260-130	-01	1			Valve, manual
260-140	-01	1			Valve, automatic, solenoid valve and limit switches
260-150	-01	1			Piping, fill pipe

Bagging System

Item Number	Ext.	Abel Quan	Cust Quan	Option Quan	Description
300-010	-01	4			Level sensor
	-02	4			Electronic probe type
300-020	-01	4			Gate
	-02	4			Slide gate, air operated, 18", solenoid valve and two limit switches
300-030	-01	1			Surge hopper
300-040	-01	1			Level sensor
	-02	1			Electronic probe type
300-050	-01	1			Bagging scale
	-02	1			High speed, high accuracy, net weighing type
300-060	-01	1			Bag sewing machine
300-070	-01	1			Bag conveyor

Automated Control System

Item Number	Ext.	Abel Quan	Cust Quan	Option Quan	Description
810-010	-01	1			Automated control system

Motor Control Center

Item Number	Ext.	Abel Quan	Cust Quan	Option Quan	Description
820-010	-01	1			Motor control center

Air Compressor

Item Number	Ext.	Abel Quan	Cust Quan	Option Quan	Description
830-010	-01	1			Air Compressor

Truck Scale

Item Number	Ext.	Abel Quan	Cust Quan	Option Quan	Description
840-010	-01	1			Truck scale

Bins And Structural Steel

Item Number	Ext.	Abel Quan	Cust Quan	Option Quan	Description
910-020	-01	1			Structural steel, lower
	-02	1			Approximately 14' wide x 49' long x 30' high
910-010	-01	1			Bin system
	-02	1			9 - 30 ton bins, 5 - 15 ton bins, galvanized exterior
910-020	-01	1			Structural steel, headhouse
	-02	1			Approximately 14' wide x 49' long x 25' high

Miscellaneous Structures

Item Number	Ext.	Abel Quan	Cust Quan	Option Quan	Description
920-010	-01	1			Miscellaneous structures
	-02	1			Service platforms, catwalks, etc.
920-020	-01	1			Miscellaneous materials
	-02	1			Spouting, flanges, raw steel, etc.

Warehouse

Item Number	Ext.	Abel Quan	Cust Quan	Option Quan	Description
930-010	-01	1			Building materials for the processing tower
					(This is not the warehouse)

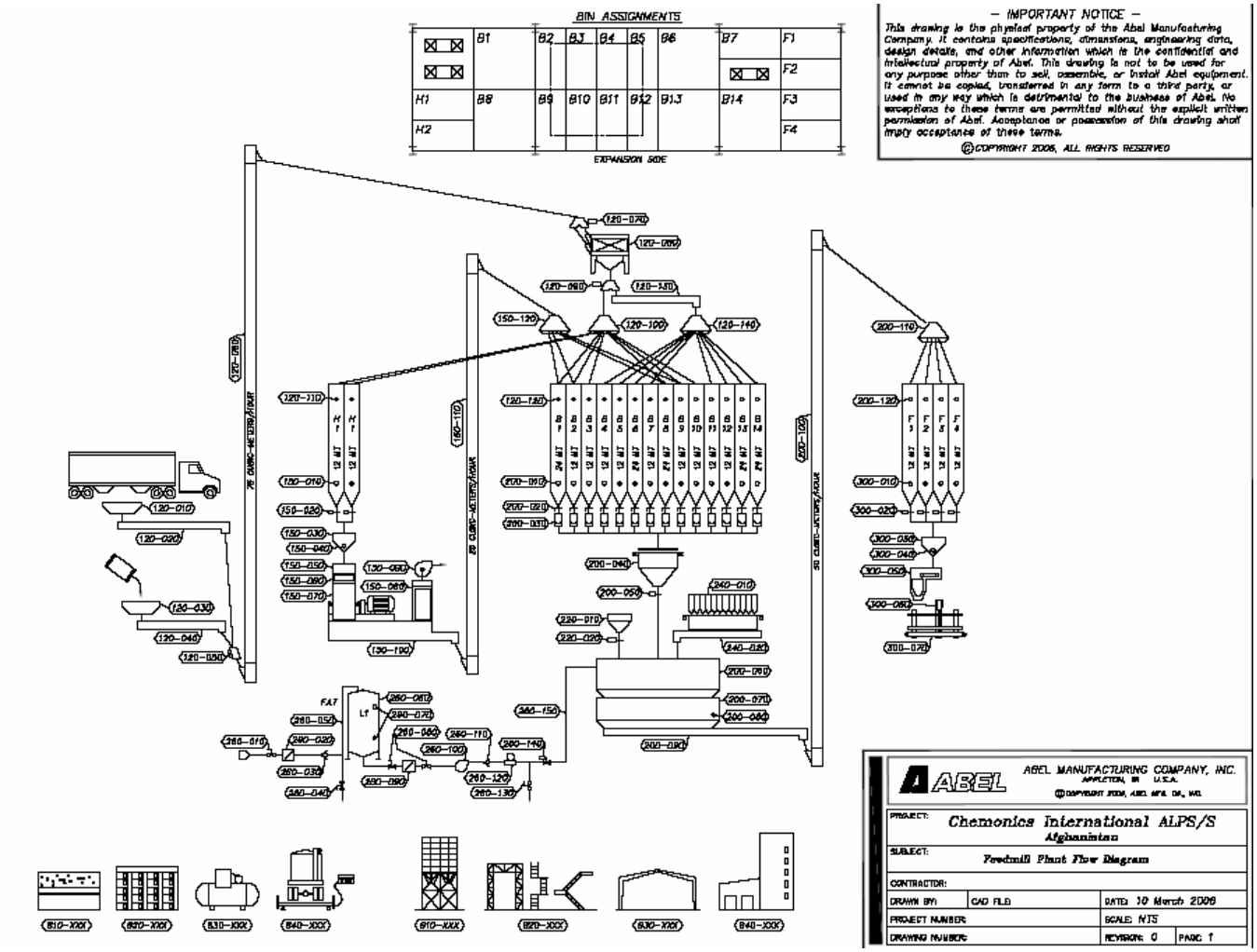
- EXCLUSIONS -

The following is a partial list of items not included in this proposal. Some or all of these items may be required for this project:

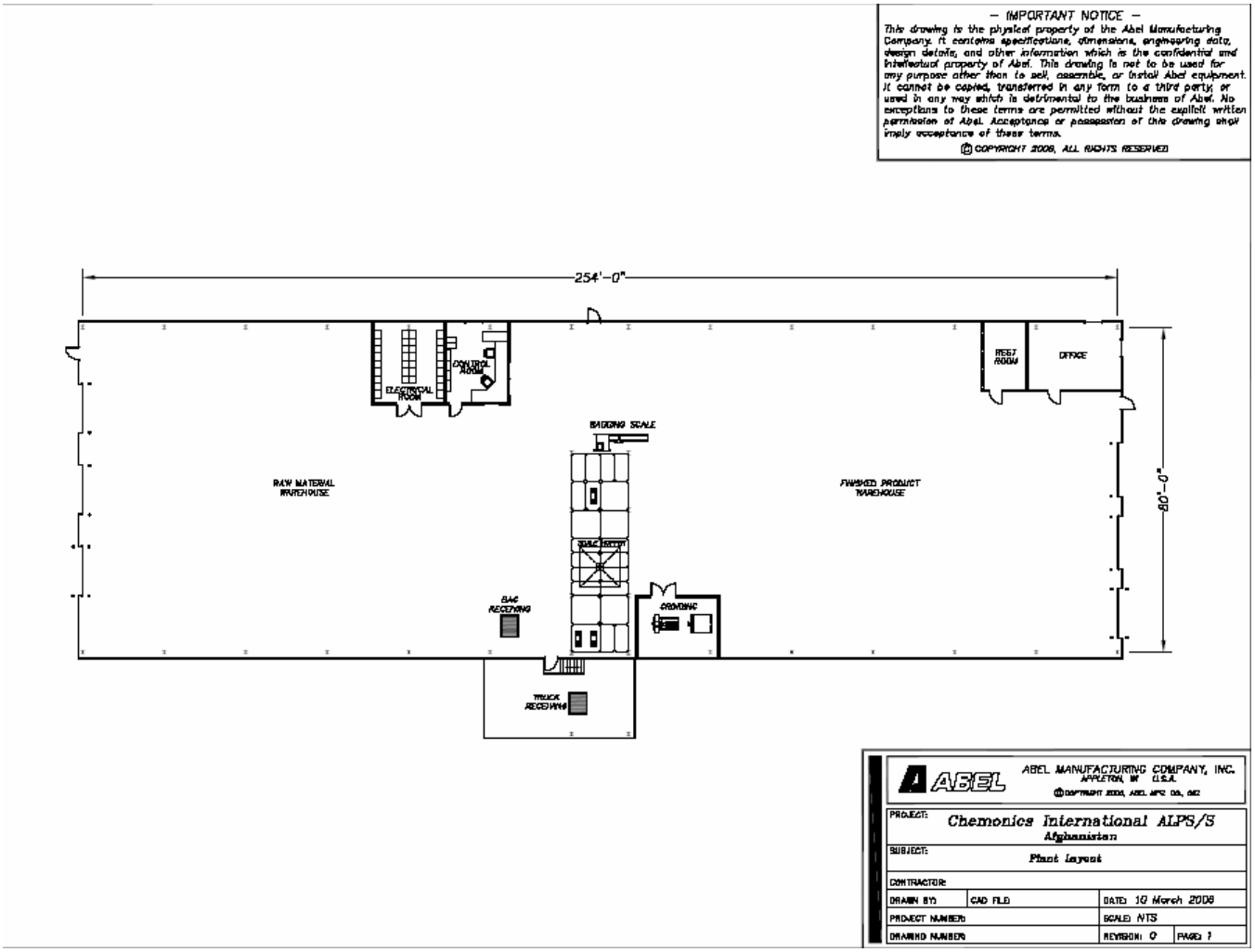
- Any type of insurance for construction, equipment, or any other type of insurance which may be necessary or desirable. This insurance is available as an option
- Any taxes, fees, duties, or any other expenses assessed by entities within the country of destination
- Inland freight within the country of destination
- Excavation and site preparation
- Soil testing
- Concrete work
- Erection or installation labor
- General buildings other than main warehouse
- Process piping
- Lighting, wire, conduit, transformers and other miscellaneous electrical equipment not specifically included in this proposal
- Plumbing
- Heating, ventilating, and air conditioning systems
- Offices, bathrooms, laboratory
- Pollution control systems not specified in this proposal
- Painting and finishing work, and painting and finishing supplies
- Any items in this proposal specified to be locally fabricated or to be locally supplied
- Spare parts except as noted
- Any item not explicitly listed as included in this proposal

NOTE: Abel would be pleased to provide a quotation on any of the above equipment or services.

COMMERCIAL FEED MILL FLOW DIAGRAM



COMMERCIAL FEED MILL GENERAL LAYOUT



APPENDIX 1.B

EXAMPLE OF PROPOSED FEED MILL

This photo shows, in general, what the proposed feed mill will look like. The 8,400 MT Grain storage system proposed on this project will replace the blue Harvestor Silo pictured above. (Refer to Appendix 5)

APPENDIX 2

FINANCIAL VIABILITY (Lamb Fattening Project)

5.2 BASIS AND ASSUMPTIONS :

5.2.1 The costs of land and site development are included, with the assumption that the business will need 0.5 hectares of land, with a total cost estimate of US $9,875.

5.2.2 The cost of building facilities is based on prevailing market prices. Construction costs are assumed at US $50/ sq. meters, for a total of 560 sq. meters for sheep housing facilities, plus 170 sq. meters for storage of feed, for a total cost of US $36,500.

5.2.3 Cost estimates for miscellaneous fixed assets are based on prevailing market prices, and are estimated at US $9,450. This includes a generator for the production of electrical power, tools, furniture, fixtures, etc.

5.2.4 Assumptions regarding sheep production are as follows:

No.	Item	Years		
		1st	2nd	3rd
1.	Number of Sheep Produced/Cycle	250	250	250
2.	Number of Cycles/Year	4	4	4
3.	Number of Days/Cycle	90	90	90
4.	Capacity Utilisation %	90	100	100
5.	Total Number Sheep Produced	900	1000	1000
6.	Sheep Mortality/Year	4%	4%	4%
7.	Number of Sheep Sold	864	960	960

Other important assumptions include the following:

- Young lambs will be purchased at approximately 20 kilos/lamb, at an assumed price of US $15/lamb.
- Gender ratio for commercial sheep farming is 45 females to 5 males.
- Lambs will be fed for 90 days, and be sold at a weight of about 29 kilos on average.

5.2.4 Feed required per lamb is assumed at 67.5 kilos per cycle, with a feed costs of US 0.25$ per kilo. Cost for medicine is assumed at US $0.13 per sheep/cycle.

5.2.5 Sale price of live sheep is assumed at US $2 per kilo, at 29 kilos/sheep. This follows FAO estimates of common practices in Afghanistan. Sale of wool is assumed as a one-time sale at US $0.70/kilo, with a yield of 1.2 kilo/lamb.

5.2.6 Salaries and wages are assumed at the existing salary structure, with a 5% increase in wages each year. Expectations are that one supervisor will earn US $150/month, and labourers US $75/month.

5.2.7 Utility requirements and its costs are based on prevailing market prices. Assumptions are that a small generator will be required for the provision of electricity for the operation of a water pump, and other machinery as needed. The cost of fuel is estimated at US $0.60 per litre.

5.2.8 Miscellaneous costs including repairs and maintenance, advertising, communication costs, etc., are included. The annual costs of repairs and maintenance, for example, is assumed at 3% of the cost of fixed assets.

5.2.9 Interest on a long term loan is assumed at 18%, which is the high end of interest rates of such loans with the Afghanistan International Bank, one of the primary providers of such loans. Expectations are that 50% of start-up funds will be provided directly by investors, and the remaining provided in loans.

5.2.10 Working capital needs are based on the sheep production cycle. The cycle assumed is 90 days from purchase to sales, at 4 cycles a year. The interest rate on a working loan is assumed at 18%.

5.2.11 The working capital loan is assumed to be paid in 18 six-month instalments, with a moratorium period of one year.

5.2.12 The depreciation method used is SLM (Straight Line Method), at 3% for buildings, and 10% for other fixed assets. However, for taxation purposes and profitability estimates, the WDV (Written Down Value method) is used, at 10% for buildings and 25% for other fixed assets.

5.2.13 Taxation of profits is been assumed at 10%, in accordance with present Afghan tax laws.

5.3 COST OF PROJECT AND MEANS OF FINANCING :

5.3.9 Total project cost of establishing a sheep fattening farm is estimated at US $63,413. Summary of project cost is as follows:

	Line Items	**US $**	**Afs.**
a)	Land and Site Development	9,875	493,750
b)	Buildings and Civil Works	36,500	1,825,000
d)	Miscellaneous Fixed Assets	9,450	472,500
e)	Margin Money for Working Capital	5,207	260,342
	Total	**61,032**	**3,051,592**

5.3.10 Financing :

Assumptions are that the investor will provide 50% of project cost, with the balance borrowed from financial institutions, per the following:

#	**Source of Funds**	**US $**	**Afs.**
1	Investor – 50%	30,516	1,525,796
2	Loan Funds – 50%	30,516	1,525,796
	Total Funds Required	63,413	3,051,592

In addition, working capital will be borrowed, and used for the purchase of livestock feed.

5.3 PROJECTED FINANCIAL STATEMENTS :

5.3.1 **Projected Profitability:** (Schedule – B)

Detailed projected profitability and cash flow are as follows:

(US $)

No.	**Items**	**1st year**	**2nd year**	**3rd year**
1	***Sales Revenue from Lamb***	43,226	55,646	56,482
2	Cost of Production	33,519	44,101	44,427
3	Profit (PAT)	9,707	11,545	12,055

5.3.2 The average Debt Service Coverage Ratio for the project, per year, is 2.81 based on loan and interest payments, over a period of 9 years.

5.3.3 Project cash flow increases from US $6,906 in the first year to US $11,721 in the fifth year of operations. Cash accruals increase from US $12,112 in year one, to US $55,057 in year five. (Schedule - D).

5.3.4 The balance sheet indicates an increase in net current assets from US $29,469 in year one, to US $74,879 in the fifth year of operations. (Schedule – E)

5.3.5 **Important Ratios:** (Schedule – F)

A financial projection for the lamb feeding project indicates the following for the 2nd year of operation:

Financial Measurements		2nd Year
1. EBIT to Capital Employed		US $24.57
2. Return on Investment		
i) PBT to Capital Employed		13.50
ii) PAT to Capital Employed		12.51
iii) PBT to Net Worth		24.07
iv) PAT to Net Worth		22.30
3. PBT to Sales		22.39
4. Raw Materials Cost to Sales		55.41
5. Operating Ratio		59.25
6. Interest Coverage Ratio		2.90
7. Fixed Assets Turnover Ratio		1.09
8. Debt Equity Ratio		0.52
9. Ratio of N/W + L/T Liabilities to Fixed Assets		1.54
10.Current Ratio		2.99

5.3.6 The break even point (BEP) for the proposed project, is 41.62% of installed capacity, and 46.24% of utilised capacity in year one. The BEP reduces to 31.91% in year five, due to reductions in loan payments.

5.3.7 **Sensitivity Analysis:** (Schedule – H)

Sensitivity analysis has been performed by reviewing the impact of Utilized and Installed BEP, as a function of an increase of variable costs by 10%, or decrease in sales revenue of 10%:

Sr. No.	Parameter	BEP Utilised %	BEP Installed %
1	Sales Revenue Decreased by 10%	59.71	53.74
2	**Total Variable Costs (TVC) Increased by 10%**	52.88	47.59

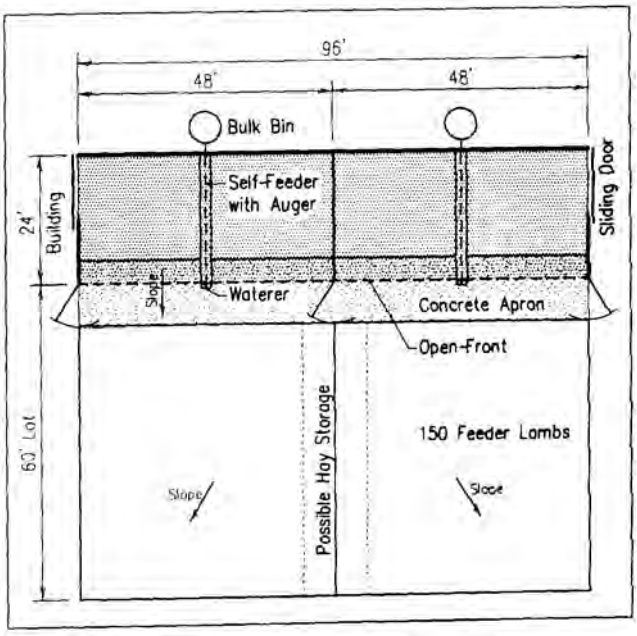
5.3.8 The pay back period for the project, based on financial projections, is estimated at 4 years and 4 months. (Schedule – I)

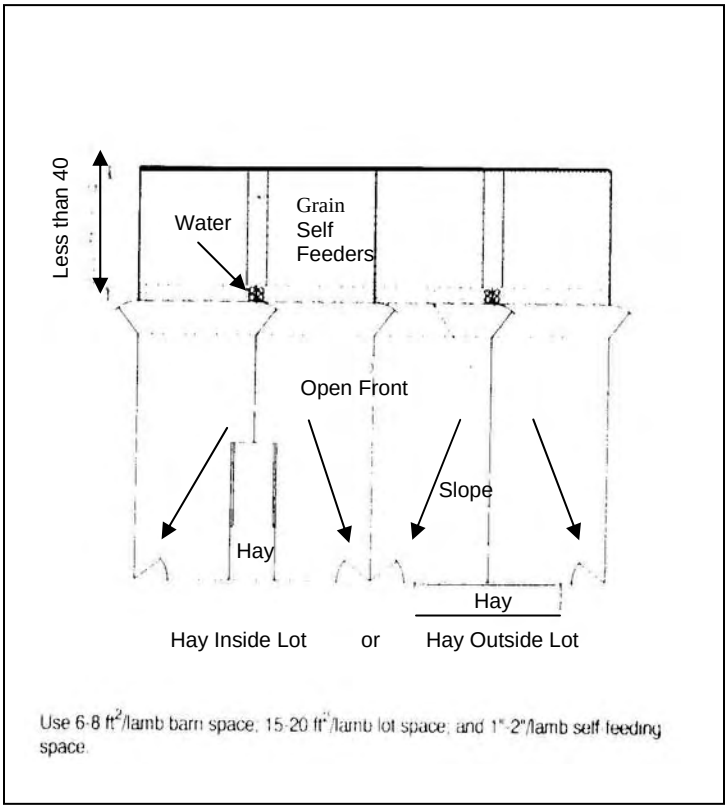
5.3.9 The Internal Rate of Return (IRR) is estimated at 20.21% before taxes, and 18.32% after taxes, both of which are strong returns.

Based on the above assumptions, the project appears to be feasible, and profitable.

APPENDIX 2 CONTINUED

Layout Ideas for the Lamb Fattening Facility





Use 6-8 ft²/lamb barn space; 15-20 ft²/lamb lot space; and 1"-2"/lamb self feeding space.

APPENDIX 3

BROILER FACILITY

FINANCIAL VIABILITY
(Broiler Farm)

5.3 BASIS AND ASSUMPTIONS :

5.3.1 Cost of land and site development is taken into account, assuming 0.2 hectares of land will be required, at US $8,300.

5.3.2 The cost of the building to house the broilers is estimated at US $22,000, assuming construction costs at fair-market-prices of US $50/meter squared.

5.3.3 Cost estimates for miscellaneous fixed assets are based on prevailing prices, at US $27,500. Assets include cages, an electric generator, tools, furniture, fixtures, etc.

5.3.4 Assumptions regarding broiler production is as follows:

No.	Items	Years		
		1st	2nd	3rd
1.	Broiler Production Capacity	5000	5000	5000
2.	Number of Cycles	4	4	4
3.	Number of Days/Cycle	63	63	63
4.	Capacity Utilisation	90	100	100
5.	Total Production	18,000	20,000	20,000
6.	Bird Mortality	5%	5%	5%
7.	No. Birds Sold	17,100	19,000	19,000

Other assumptions include:

- Weight of live birds at the end of a 60 day production cycle is 2.0 kilograms.
- Commercial sale of bird manure is not included in income projections, although it can be expected to increase project viability.
- The price of one-day-old chicks is assumed at US $0.35.
- Feed required per bird is assumed at 5.00 kilo per production cycle, with the cost of feed at US $0.35/kilo.
- Cost of medicine is assumed at US $0.10 cents/bird/ cycle.

5.3.4 Assumptions are that a live bird will be sold at US $1.85/ kilo, and weigh an average of 2 kilograms.

5.3.5 Salaries and wages are listed at the exiting salary structure of Helmand province, with 5% increase in wages per year. The salary of one supervisor is estimated at US $150/month, and three labourers at US $75/month per labourer.

5.3.6 Utility requirements and its costs are based on prevailing market prices. Assumptions are that a small generator will be required for electricity needs, including operation of a water pump for well water and other needs. Cost of fuel is assumed at US $0.60/liter.

5.3.7 Costs such as repairs and maintenance, marketing, communication costs, etc., are included as a percent of specific costs. Repair and maintenance, for example, is given at 3% of fixed assets per year.

5.3.8 Interest rate on loans is assumed at 18% per year, which is at the high end of the range provided by the Afghanistan International Bank, a likely provider of such loans. Expectations are that 50% of start-up costs will be provided out-of-pocket by the investor, and the remaining 50% via a loan. Assumptions are that the loan will be paid in 16 six-month instalments, with no initial moratorium period.

5.3.9 Working capital requirements are based on the production cycle (referenced above), with the interest rate on working capital assumed at 18%.

5.3.10 Depreciation is derived using SLM (Straight Line Method). However depreciation using WDV (Written-Down-Value) is computed for taxation purposes, and for determining the profitability of the project.

5.3.11 Taxation on profits is assumed at 10%, per present Afghan tax laws.

5.4 COST OF PROJECT AND MEANS OF FINANCING :

5.3.11 Total project cost of establishing a broiler poultry operation in Helmand province is estimated at US $63,972, per the following:

	Line Items	**US $**	**Afs.**
a)	Land and Site Development	8,300	415,000
b)	Buildings and Civil Works	22,000	1,100,000
d)	Miscellaneous Fixed Assets	27,500	1,375,000
e)	Margin Money for Working Capital	6,118	305,908
	Total	**63,918**	**3,195,908**

5.3.12 Project Financing :

Assumptions are that the investor will contribute 50% of project cost, with the balance borrowed by a financial institution, per the following:

#	**Source**	**US $**	**Afs.**
1	Entrepreneur – 50%	31,959	1,597,954
2	Bank Funds – 50%	31,959	1,597,954
	Total Funds Required	**63,918**	**3,195,908**

Financing will also be needed for working capital, to be used to purchase poultry feed and medicines.

5.4 PROJECTED FINANCIAL STATEMENTS :

5.4.1 **Projected Profitability:** (Schedule – B)

Projected profitability and cash flow is given below in USD, per the following:

(US $)

No.	Line Items	1st year	2nd year	3rd year
1	**Sales Revenue**	54,247	69,302	70,296
2	Cost of Production	44,504	57,182	57,707
3	Profit (PAT)	9,743	12,120	12,590

5.4.2 Debt Service Coverage Ratio, based on repayment of the initial loan to pay start-up costs in 8 years, is 2.65. This indicates that the repayment of the loan does not create an undue burden on the facility.

5.4.3 Cash flows increase from US $3,356 in the first year, to US $13,367 in the fifth year of operations. Cash accruals increase from US $9,474 in year one, to US $59,073 in the fifth year of operations.

5.4.4 The balance sheet indicates an expected increase in net current assets of the business, from US $29,868 in the first year, to US $82,054 in the fifth year of operations. (Schedule – E)

5.4.5 Financial Ratios: (Schedule – F)

Financial projections for the proposed poultry farm indicates the following, for the 2nd year of operations:

Particulars		2nd Year
1. EBIT to Capital Employed		$ 26.09
2. Return on Investment		
i) PBT to Capital Employed		13.87
ii) PAT to Capital Employed		12.91
iii) PBT to Net Worth		24.18
iv) PAT to Net Worth		22.52
3. PBT to Sales		18.78
4. Raw Materials Cost to Sales		61.17
5. Operating Ratio		64.67
6. Interest Coverage Ratio		3.16
7. Fixed Assets Turnover Ratio		1.38
8. Debt Equity Ratio		0.45
9. Ratio of N/W + L/T Liabilities to Fixed Assets		1.55
10.Current Ratio		2.71

Legend:

- PBT: Profit Before taxes
- EBIT: Earning before Interest and Taxes
- NW: Net Worth

5.4.6 The break even point (BEP) for the proposed project is 68% of utilised capacity, and 61% of installed capacity. The details behind this calculation are provided in Schedule G.

5.4.7 **Sensitivity Analysis:** (Schedule – H)

Sensitivity analysis has been carried out per the following:

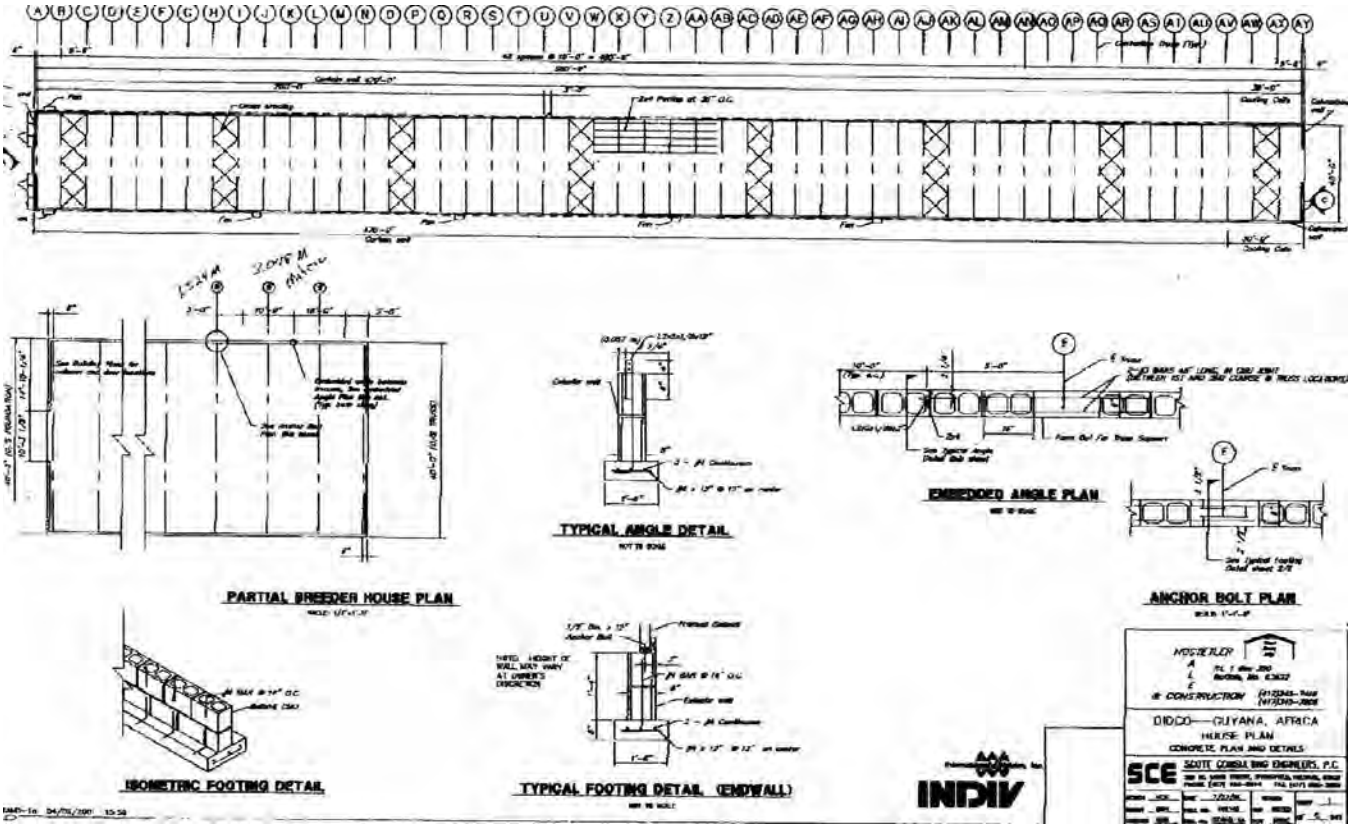
#	Parameter	BEP Utilised %	BEP Installed %
1	Sales Revenue Decreased by 10%	99	68
2	**Total Variable Costs Increased by 10%**	87	60

5.4.8 The pay back period for the project, based on financial projections, is estimated at 4 years and 2 months. (Schedule I)

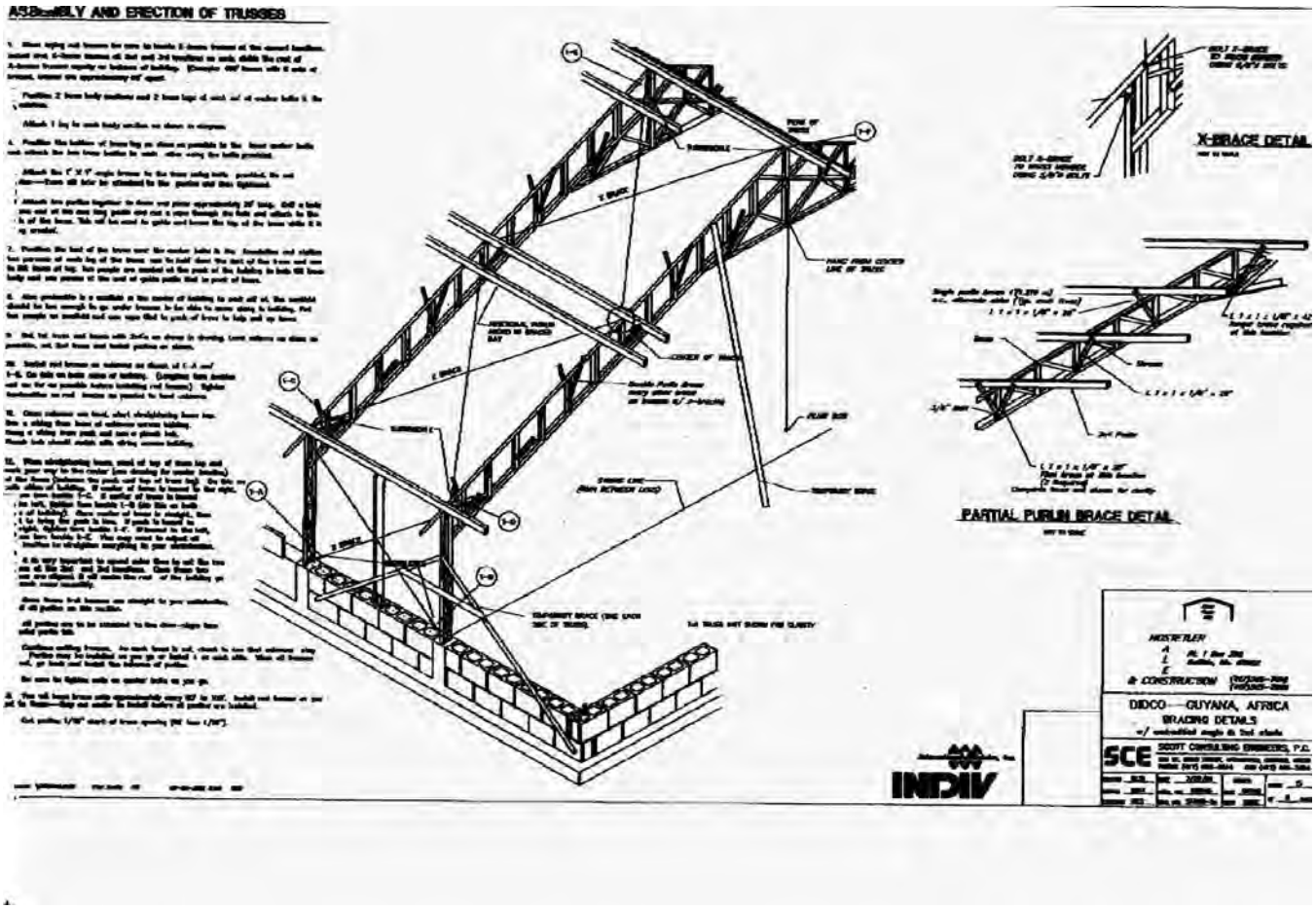
5.4.9 The Internal Rate of Return (IRR) is 21.1%, after taxes.

Based on the above assumptions made for project cost and cost of production, the project appears to be feasible and profitable.

Layout: Broiler Building



ROOF JOIST for BROILER BUILDING



WUFF DA

Formula Cost / tonne = $219.42

Diet Name: Broiler0-17

Feasible

Ingredient	Cost $/tonne	Min. %	Amount %		Max. %
Alf. Meal 17%	200.00	0.000	**0.000**	?	0.000
Corn Grain	197.00	0.000	**43.001**	?	100.000
Dicalcium Phosphate	470.00	0.000	**1.973**	?	100.000
DL-Methionine	4000.00	0.000	**0.158**	?	100.000
Limestone	15.00	0.000	**4.875**	?	100.000
Salt	45.00	0.300	**0.300**	?	0.300
Soy 48	410.00	0.000	**19.434**	?	100.000
Soybean Oil	1217.00	0.000	**0.000**	?	100.000
Sunflower Seeds MSE	175.00	0.000	**0.000**	?	0.000
Torula Yeast	420.00	0.000	**0.000**	?	0.000
Wheat, Soft White	118.00	0.000	**20.000**	?	20.000
Wheat Middlings	100.00	0.000	**0.000**	?	0.000
Lysine-HCl	4000.00	0.000	**0.009**	?	100.000
Premix	1300.00	0.000	**0.000**	?	0.000
fishmeal	1200.00	0.000	**0.000**	?	0.000
mardakan premix	2660.00	0.250	**0.250**	?	100.000
soyabean 44	410.00	0.000	**0.000**	?	0.000
Davachy concentrate	783.00	0.000	**0.000**	?	0.000
Poultry BP meal	79.50	0.000	**10.000**	?	10.000
	0.00	0.000	**0.000**	?	0.000
	0.00	0.000	**0.000**	?	0.000
	0.00	0.000	**0.000**	?	0.000
	0.00	0.000	**0.000**	?	0.000
	0.00	0.000	**0.000**	?	0.000
	0.00	0.000	**0.000**	?	0.000
TOTAL			**100.00**		

Nutrient	Required	Supplied		Max.
Dry Matter	0.00	**83.09**	?	100.00
Metabolozable Energy	2900.00	**2900.00**	?	10000.00
Protein	21.00	**21.00**	?	100.00
Ether Extract	0.00	**3.63**	?	100.00
Linoleic Acid	0.00	**0.00**	?	100.00
Crude Fiber	0.00	**2.45**	?	100.00
Calcium	1.00	**2.72**	?	100.00
Total Phosphorus	0.00	**0.89**	?	100.00
Avail. Phosphorus	0.45	**0.450**	?	100.00
Potassium	0.00	**0.654**	?	100.00
Chlorine	0.00	**0.245**	?	100.00
Manganese	0.00	**87.015**	?	5000.00
Sodium	0.00	**0.183**	?	100.00
Zinc	0.00	**87.058**	?	5000.00
Iron	0.00	**404.171**	?	5000.00
Copper	0.00	**13.154**	?	5000.00
Selenium	0.00	**0.332**	?	5000.00
Magnesium	0.00	**1417.401**	?	5000.00
Sulfur	0.00	**0.195**	?	100.00
Vitamin E	0.00	**346.176**	?	5000.00
Thiamin	0.00	**286.419**	?	5000.00
Riboflavin	0.00	**85.666**	?	5000.00
Niacin	0.00	**613.328**	?	5000.00
Pyridoxine	0.00	**63.554**	?	5000.00
Vitamin B-12	0.00	**246.843**	?	5000.00
Biotin	0.00	**1.640**	?	5000.00
Choline	0.00	**1780.452**	?	5000.00
Folate	0.00	**25.605**	?	5000.00
ARG	0.00	**1.332**	?	100.00
GLY	0.00	**1.270**	?	100.00
SER	0.00	**1.022**	?	100.00
GLY&SER	0.00	**2.292**	?	100.00
HIS	0.00	**0.515**	?	100.00
ILE	0.00	**0.894**	?	100.00
LEU	0.00	**1.690**	?	100.00
LYS	1.10	**1.100**	?	100.00
MET	0.45	**0.500**	?	100.00
CYS	0.00	**0.142**	?	100.00
TSAA	0.90	**0.900**	?	100.00
PHE	0.00	**0.991**	?	100.00
TYR	0.00	**0.683**	?	100.00
TAAA	0.00	**1.675**	?	100.00
THR	0.00	**0.751**	?	100.00
TRP	0.00	**0.235**	?	100.00
VAL	0.00	**1.050**	?	100.00

WUFF DA

Formula Cost / tonne = $293.40

Diet Name: Broiler14-21

Feasible

Ingredient	Cost $/tonne	Min. %	Amount %		Max. %
Alf. Meal 17%	200.00	0.000	**0.000**	?	0.000
Corn Grain	197.00	0.000	**28.605**	?	100.000
Dicalcium Phosphate	470.00	0.000	**0.000**	?	0.000
DL-Methionine	4000.00	0.000	**0.000**	?	0.000
Limestone	1.00	0.000	**0.000**	?	100.000
Salt	45.00	0.000	**0.000**	?	0.000
Soy 48	417.00	0.000	**22.206**	?	100.000
Soybean Oil	1325.00	1.000	**1.000**	?	100.000
Sunflower Seeds MSE	128.00	0.000	**10.000**	?	10.000
Torula Yeast	420.00	0.000	**0.000**	?	0.000
Wheat, Soft White	138.00	0.000	**28.190**	?	100.000
Wheat Middlings	100.00	0.000	**0.000**	?	0.000
Lysine-HCl	4000.00	0.000	**0.000**	?	0.000
Premix	1300.00	0.000	**0.000**	?	0.000
fishmeal	1200.00	0.000	**0.000**	?	0.000
premix	2660.00	0.000	**0.000**	?	0.000
soyabean 44	394.00	0.000	**0.000**	?	0.000
5%davachiconcentrate	964.00	0.000	**0.000**	?	0.000
Poultry BP meal	175.00	0.000	**0.000**	?	0.000
10%davacyconcentrat	795.00	10.000	**10.000**	?	100.000
	0.00	0.000	**0.000**	?	0.000
	0.00	0.000	**0.000**	?	0.000
	0.00	0.000	**0.000**	?	0.000
	0.00	0.000	**0.000**	?	0.000
	0.00	0.000	**0.000**	?	0.000
TOTAL			**100.00**		

Nutrient	Required	Supplied		Max
Dry Matter	0.00	**88.83**	?	100.
Metabolozable Energy	2850.00	**2850.00**	?	5000
Protein	21.00	**21.95**	?	100.
Ether Extract	0.00	**3.27**	?	100.
Linoleic Acid	0.00	**0.11**	?	100.
Crude Fiber	0.00	**5.09**	?	100.
Calcium	0.85	**0.92**	?	100.
Total Phosphorus	0.00	**0.77**	?	100.
Avail. Phosphorus	0.40	**0.446**	?	100.
Potassium	0.00	**0.740**	?	100.
Chlorine	0.00	**0.014**	?	100.
Manganese	0.00	**91.716**	?	5000
Sodium	0.00	**0.177**	?	100.
Zinc	0.00	**82.255**	?	5000
Iron	0.00	**95.897**	?	5000
Copper	0.00	**19.662**	?	5000
Selenium	0.00	**0.198**	?	5000
Magnesium	0.00	**1971.320**	?	5000
Sulfur	0.00	**0.184**	?	100.
Vitamin E	0.00	**35.624**	?	5000
Thiamin	0.00	**4.224**	?	5000
Riboflavin	0.00	**6.568**	?	5000
Niacin	0.00	**64.218**	?	5000
Pyridoxine	0.00	**7.350**	?	5000
Vitamin B-12	0.00	**0.020**	?	5000
Biotin	0.00	**0.134**	?	5000
Choline	0.00	**1445.844**	?	5000
Folate	0.00	**1.016**	?	5000
ARG	0.00	**1.239**	?	100.
GLY	0.00	**0.700**	?	100.
SER	0.00	**0.912**	?	100.
GLY&SER	0.00	**1.612**	?	100.
HIS	0.00	**0.479**	?	100.
ILE	0.00	**0.833**	?	100.
LEU	0.00	**1.459**	?	100.
LYS	1.15	**1.259**	?	100.
MET	0.45	**0.529**	?	100.
CYS	0.00	**0.396**	?	100.
TSAA	0.90	**0.925**	?	100.
PHE	0.00	**0.924**	?	100.
TYR	0.00	**0.561**	?	100.
TAAA	0.00	**1.484**	?	100.
THR	0.78	**0.780**	?	100.
TRP	0.00	**0.300**	?	100.
VAL	0.00	**0.967**	?	100.

WUFF DA

Formula Cost / tonne = $264.95

Diet Name: Broiler21-28

Feasible

Ingredient	Cost $/tonne	Min. %	Amount %		Max. %
Alf. Meal 17%	200.00	0.000	**0.000**	?	0.000
Corn Grain	197.00	0.000	**27.191**	?	100.000
Dicalcium Phosphate	470.00	0.000	**0.000**	?	0.000
DL-Methionine	4000.00	0.000	**0.000**	?	0.000
Limestone	1.00	0.000	**1.064**	?	100.000
Salt	45.00	0.000	**0.000**	?	0.000
Soy 48	417.00	0.000	**21.756**	?	100.000
Soybean Oil	1325.00	1.000	**1.000**	?	100.000
Sunflower Seeds MSE	128.00	0.000	**15.000**	?	15.000
Torula Yeast	420.00	0.000	**0.000**	?	0.000
Wheat, Soft White	138.00	0.000	**28.989**	?	100.000
Wheat Middlings	100.00	0.000	**0.000**	?	0.000
Lysine-HCl	4000.00	0.000	**0.000**	?	0.000
Premix	1300.00	0.000	**0.000**	?	0.000
fishmeal	1200.00	0.000	**0.000**	?	0.000
premix	2660.00	0.000	**0.000**	?	0.000
soyabean 44	394.00	0.000	**0.000**	?	0.000
5%davachiconcentrate	964.00	5.000	**5.000**	?	6.000
Poultry BP meal	175.00	0.000	**0.000**	?	0.000
10%davacyconcentrat	795.00	0.000	**0.000**	?	0.000
	0.00	0.000	**0.000**	?	0.000
	0.00	0.000	**0.000**	?	0.000
	0.00	0.000	**0.000**	?	0.000
	0.00	0.000	**0.000**	?	0.000
	0.00	0.000	**0.000**	?	0.000
TOTAL			**100.00**		

Nutrient	Required	Supplied
Dry Matter	0.00	**88.08**
Metabolozable Energy	2850.00	**2850.00**
Protein	19.25	**21.85**
Ether Extract	0.00	**3.22**
Linoleic Acid	0.00	**0.05**
Crude Fiber	0.00	**6.09**
Calcium	0.82	**0.82**
Total Phosphorus	0.00	**0.72**
Avail. Phosphorus	0.35	**0.353**
Potassium	0.00	**0.778**
Chlorine	0.00	**0.014**
Manganese	0.00	**23.316**
Sodium	0.00	**0.185**
Zinc	0.00	**86.977**
Iron	0.00	**101.816**
Copper	0.00	**21.358**
Selenium	0.00	**0.197**
Magnesium	0.00	**2288.849**
Sulfur	0.00	**0.197**
Vitamin E	0.00	**35.403**
Thiamin	0.00	**4.344**
Riboflavin	0.00	**6.701**
Niacin	0.00	**77.436**
Pyridoxine	0.00	**7.816**
Vitamin B-12	0.00	**0.020**
Biotin	0.00	**0.133**
Choline	0.00	**1622.348**
Folate	0.00	**1.008**
ARG	0.00	**1.336**
GLY	0.00	**0.690**
SER	0.00	**0.950**
GLY&SER	0.00	**1.639**
HIS	0.00	**0.498**
ILE	0.00	**0.872**
LEU	0.00	**1.512**
LYS	1.09	**1.201**
MET	0.43	**0.504**
CYS	0.00	**0.410**
TSAA	0.86	**0.917**
PHE	0.00	**0.968**
TYR	0.00	**0.553**
TAAA	0.00	**1.520**
THR	0.76	**0.760**
TRP	0.00	**0.297**
VAL	0.00	**1.033**

APPENDIX 4

8,400 MT GRAIN STORAGE FACILITY

Quotation

Mark La Grange
Date; 3/7/2006
Validity; 3/22/2006 Reference; NC05122902

Item.	Qty.	Part Number	Description.			Total Net Price	Weight
1	1		**C1 Road Intake Chain & Flight Conveyor.**			$6,266.00	1,627kg
				Conveyor model	1212G-20		
				Overall length	6.10 meters		
				Cubic capacity	141 M^3/hr		
				Handling rate	113 TPH		
				Product	Wheat		
				Density	800 kg/M^3		
				Head shaft	49 mm diameter, journaled head shaft.		
				Tail shaft	49 mm diameter tail shaft		
				Chain type	66 mm pitch roller		
				Working load	1,452 kg		
				Chain speed	0.73 M/sec		
	1	500-3-50	3.75 Kw - 5 Hp 50 Hz 3 Phase TEFC Motor				
	1	56515T2BV2	TA2115 Class II speed reducer drive package.				
	1	0	Bypass Dump Hopper x 120” Long				
	1	912-12-GRATE	10 Ft. Bar Grate for Dump Hopper				
	1	ID8X8G	203 mm by 203 mm Cover Inspection Door.				
	1	12PSG	End Relief Door with Standard Limit Switch.				
	1	HDT1212CNG	Head Discharge Transition to 305 mm Square - Centered Outlet (Unlined)				
2	2		**E1 & E2 Main Elevator Belt & Bucket Elevators**.			$32,562.00	10,985kg
				Elevator model	40G24-115		
				Discharge height	35.05 meters		
				Cubic capacity	141 M^3/hr		
				Handling rate	113 TPH		
				Product	Wheat		

Item	Qty	Part Number	Description		Total Net Price	Weight
			Density	800 kg/M^3		
			Head shaft	75 mm diameter, journaled head shaft.		
			Boot Shaft	49 mm diameter shaft.		
			Belt Speed	3.41 M/sec		
			Bucket Information			
				Single row of 279 wide by 152 deep heavy duty polyethylene buckets on 178 centers.		
			Trunking Construction	14 Ga Galvanized Construction.		
	1	2000-3-50	15 Kw - 20 Hp 50 Hz 3 Phase TEFC Motor			
	1	207315TSV2	TA4207 Class II speed reducer drive package.			
	1	MHC01108	Back Stop Assembly TA4			
	1	0	115' Foot OSHA Platform, Ladder and Safety Cage Packages			
	1	HSP-1624	OSHA Head Service Platform.			
	2	24GBHF	Flared Boot Hopper.			
	1	BE1612DT10L	Transition To 254 mm Round Urethane Lined.			
3	1		**'Z' Flow Cleaner**.		$8,066.00	1,051kg
			Handling rate	197 Tph		
			Product	Wheat		
			Density	800 kg/M^3		
	1	VFA7K-GSS	7,000 BPH 'Z Flow' Screener			
	1	VFK7K-CRS	Set of corn screens.			
	1	VFK7K-BRS	Set of bean screens.			
	1	VFK7K-WRS	Set of wheat screens.			
	1	0	Lined discharge to 12".			
4	1		**Galvanised Distributor**		$3,041.00	462kg
	1	DFB101045GLT	10" - 254 mm Round Flanged 10 Outlet Distributor.			
	1	FC-DCG	Cable Control Assembly.			
	5	GSB-0022	Cable Guides.			
	1	S-8473-5C	Aircraft Cable.			
5	2		**C2 & C3 Silo Fill Chain & Flight Conveyors.**		$26,458.00	4,611kg
			Conveyor model	1212G-97		
			Overall length	29.57 meters		
			Cubic capacity	141 M^3/hr		

Item	Qty	Part Number	Description		Total Net Price	Weight
			Handling rate	113 TPH		
			Product	Wheat		
			Density	800 kg/M^3		
			Head shaft	56 mm diameter, non-journaled, head shaft.		
			Tail shaft	49 mm diameter tail shaft		
			Chain type	66 mm pitch roller		
			Working load	1,452 kg		
			Chain speed	0.73 M/sec		
	1	712-3-50	5.625 Kw - 7.5 Hp 50 Hz 3 Phase TEFC Motor			
	1	7.56515T2CV2	TA2115 Class II speed reducer drive package.			
	1	12STDING	Standard Flanged Inlet, Loose 305 x 610 mm Opening.			
	1	ID8X8G	203 mm by 203 mm Cover Inspection Door.			
	1	12PSG	End Relief Door with Standard Limit Switch.			
	4	RSG1212GIILR	Manual In Line Intermediate Discharge Gate, 305 x 762 mm Opening.			
	4	ILG-1/3DG50	TEFC Electric Gate Operator - for In Line Gate.			
	4	IDT1212CNG	Intermediate Discharge Transition to 305 mm Square - Centered Outlet (Unlined)			
	1	HDT1212CNG	Head Discharge Transition to 305 mm Square - Centered Outlet (Unlined)			
6	4	NCL42-16UO	Galvanized Flat Bottom Grain Storage Silos.		$94,352.00	53,529kg
			Model	NCL42-16UO		
			Diameter	12.81 meters		
			Height to Eaves	13.06 meters		
			Overall Height	16.74 meters		
			Cubic Volume	1,805 M^3		
			Compacted Capacity	1,537 Metric Tons		
			Un-compacted Capacity	1,444 Metric Tons		
			Product	wheat		
			Density	800		
			Sidewall Corrugations	67 mm		
			Seismic UBC zone	1		
			Wind load	122 Kmh constant 176 Kmh 3 second gust.		

Item	Qty	Part Number	Description	Total Net Price	Weight
7	4	LS-6724	16-Ring 2.66 Inside Ladder Packages.	$1,128.00	314kg
8	4	LS-6788	16-Ring 2.66 Outside Ladder Packages.	$3,996.00	1,247kg
9	8	L-540	Bin Level Indicator Packages. Visual Grain Level Indicators.	$1,376.00	8kg
10	20	S-2739	Polyurethane Base Sealer Packages. 5PC. Box Poly-Base Sealer Strips.	$860.00	46kg
11	16	CRP-5286	In Silo Temperature Monitoring System. The complete temperature monitoring system is complete as follows 42' Temperature Cable Support Packages.	$7,312.00	807kg
	4		Centre Cables. 15.55 meter long cables with 9 T/C on 1.83 meter spaces, 1 cable per silo.		
	16		Radial Cables. 13.72 meter long cables with 8 T/C on 1.83 meter spaces, 4 cables per silo.		
	1	TSGC12PORT/C	Portable Temperature Reading Unit.		
12	4	A-42008	Flush Floor In Silo Aeration Packages. Square Y Cut-Lok 10 Hp - 7.5 Kw, 2900 rpm 50 Hz (less controls) High Speed Centrifugal Fan	$11,336.00	3,576kg
	4	CHS-10-6G			

Number of fans per silo	1
Cubic meters per second	1.978 M^3/sec
Litres per tonne per second	1.370 ltrs/T/sec
Static pressure	13.68 mbar
Product	Wheat
Density	800 kg/M^3

Item	Qty	Part Number	Description		Total Net Price	Weight
	4	TR-4013	Flush Floor Aeration Transition			
	4	TR-4015	Stiffener Support Post			
	4	MIS-6783	Box of 5 Unassembled Slim Profile Auto Roof Vent Units			
	20	42RVPL	Roof Vent Punched Roof Sheets.			
13	2	FCDL42-8-N	**Galvanised Flat Bottom Grain Storage Silos**.		$32,712.00	14,114kg
				Model: FCDL42-8-N		
				Diameter: 12.81 meters		
				Height to Eaves: 8.97 meters		
				Overall Height: 12.65 meters		
				Cubic Volume: 1,280 M^3		
				Compacted Capacity: 1,090 Metric Tons		
				Un-compacted Capacity: 1,024 Metric Tons		
				Product: Wheat		
				Density: 800		
				Sidewall Corrugations: 101 mm		
				Seismic UBC zone: 1		
				Wind load: 122 Kmh constant 176 Kmh 3 second gust.		
14	2	LS-6748	8-Ring (4) Inside Ladder Packages.		$354.00	110kg
15	2	LS-6812	8-Ring (4) Outside Ladder Packages.		$1,118.00	290kg
16			Bin Level Indicator Packages.		$688.00	4kg
	4	L-540	Visual Grain Level Indicators.			
17			Polyurethane Base Sealer Packages.		$430.00	23kg
	10	S-2739	5PC. Box Poly-Base Sealer Strips.			
18			Flush Floor In Silo Aeration Packages.		$17,600.00	5,693kg
	2	PCL-1607H	20 Gauge Cor-Lok, High Back Flashing,			
	2	CF30-10-6G	10 Hp - 7.5 Kw, 1440 rpm 50 Hz (less controls) Low Speed Centrifugal Fan			

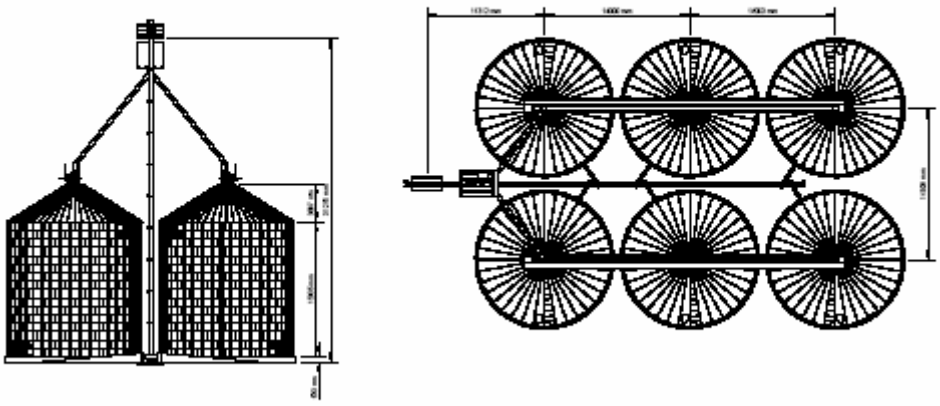
Item	Qty	Part Number	Description		Total Net Price	Weight
			Number of fans per silo	1		
			Cubic meters per second	4.760 M^3/sec		
			Liters per tonne per second	4.648 ltrs/T/sec		
			Static pressure	12.70 mbar		
			Product	Wheat		
			Density	800 kg/M^3		
	2	TR-6207	12" - 305 mm Plenum Full Floor Transitions.			
	2	TR-7077	10-15HP 1750RPM Cent Fan Faceplate-for TR-7048			
	4	MIS-6783	Box of 5 Unassembled Slim Profile Auto Roof Vent Units			
	20	42RVPL	Roof Vent Punched Roof Sheets.			
19	2	FFD-200-6	Scattergrain Grain Spreaders.		$1,440.00	64kg
20			Design III Stir-Ator System.		$9,246.00	1,284kg
	2	106N211-4200	Design III Stir-Ator System, 2 hp Motors, Triple Down Augers.			
	6	105B0084	Powder Hardsurfaced 21' Variable Pitch Down Auger.			
21			Farm Com Auger Assemblies.		$5,388.00	893kg
				Silo Diameter 12.81 M		
				Maximum Cubic Capacity 142 M^3/hr		
				Maximum Handling Capacity 113 TPH		
				Product Wheat		
				Density 800 kg/M^3		
				Auger Type Sweep		
				Auger Diameter 254 mm O.D.		
	6	GBS10420	10" Standard Bin Sweep			
	6	300-3-50	2.25 Kw - 3 Hp 50 Hz 3 Phase TEFC Motor			
	6	PT0567	Sheave 2GR 3.50OD X 1 1/8"ID Fixed Bore			
22			Farm Com Auger Assemblies.		$15,548.00	2,801kg
				Silo Diameter 12.81 M		
				Maximum Cubic Capacity 142 M^3/hr		
				Maximum Handling Capacity 113 TPH		

Item	Qty	Part Number	Description		Total Net Price	Weight
			Product	Wheat		
			Density	800 kg/M^3		
			Auger Type	Horizontal		
			Auger Diameter	254 mm O.D.		
	6	GUH10342R	10" Horizontal Unload Kit Complete			
	6	712-3-50	5.625 Kw - 7.5 Hp 50 Hz 3 Phase TEFC Motor			
	6	PT0588	Sheave 3GR 3.50OD X 1 3/8"ID Fixed Bore			
	10	0	10" Power Head Extension.			
23	1		C4 Silo Reclaim Chain & Flight Conveyor.		$8,382.00	1,959kg
			Conveyor model	1212G-100		
			Overall length	30.48 meters		
			Cubic capacity	141 M^3/hr		
			Handling rate	113 TPH		
			Product	Wheat		
			Density	800 kg/M^3		
			Head shaft	56 mm diameter, non-journaled, head shaft.		
			Tail shaft	49 mm diameter tail shaft		
			Chain type	66 mm pitch roller		
			Working load	1,452 kg		
			Chain speed	0.73 M/sec		
	1	712-3-50	5.625 Kw - 7.5 Hp 50 Hz 3 Phase TEFC Motor			
	1	7.56515T2CV2	TA2115 Class II speed reducer drive package.			
	6	12STDING	Standard Flanged Inlet, Loose 305 x 610 mm Opening.			
	1	ID8X8G	203 mm by 203 mm Cover Inspection Door.			
	1	12PSG	End Relief Door with Standard Limit Switch.			
	1	HDT1212CNG	Head Discharge Transition to 305 mm Square - Centered Outlet (Unlined)			
			Total Net Price, Ex-Factory, Assumption, Illinois		**$289,659.00**	**105,498kg**
			Container Loading Fee		**$3,750.00**	
			Documentation		**$250.00**	

	0	**0**
Total Net Price	**$293,659.00**	**105,498**

APPENDIX 5

8,400 METRIC TON GRAIN STORAGE FACILITY LAYOUT



APPENDIX 6

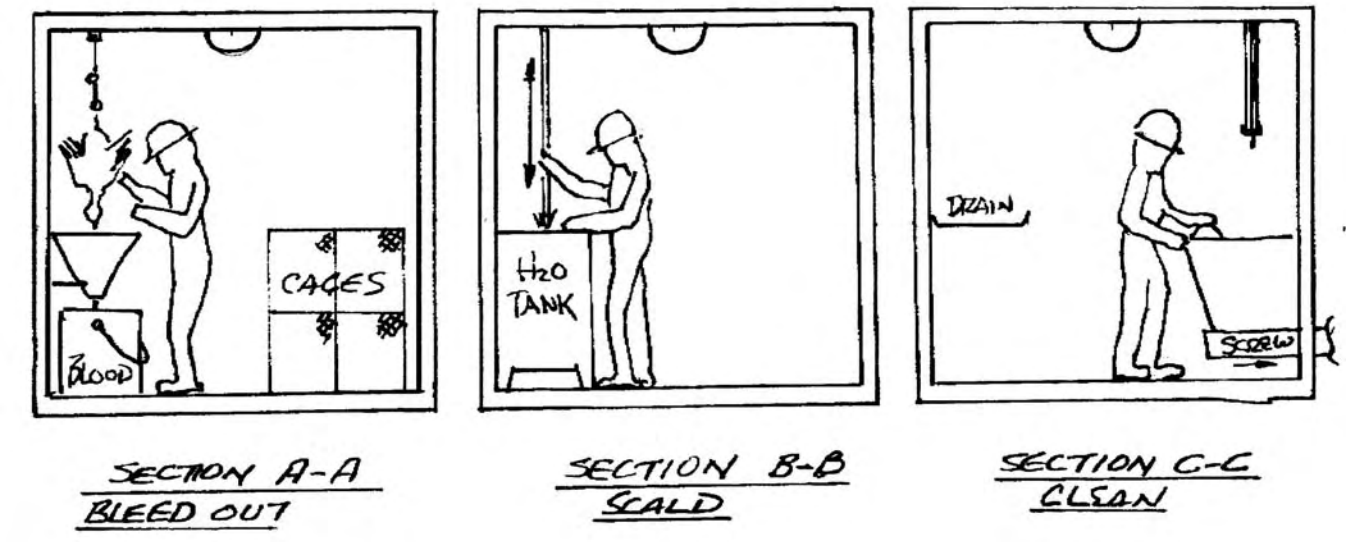
250 HEAD PER HOUR POULTRY PROCESSING FACILITY

Price $650,000 – for complete self-contained facility. Requires only civil work (foundation), electrical power and water supply to be brought to the processing facility.

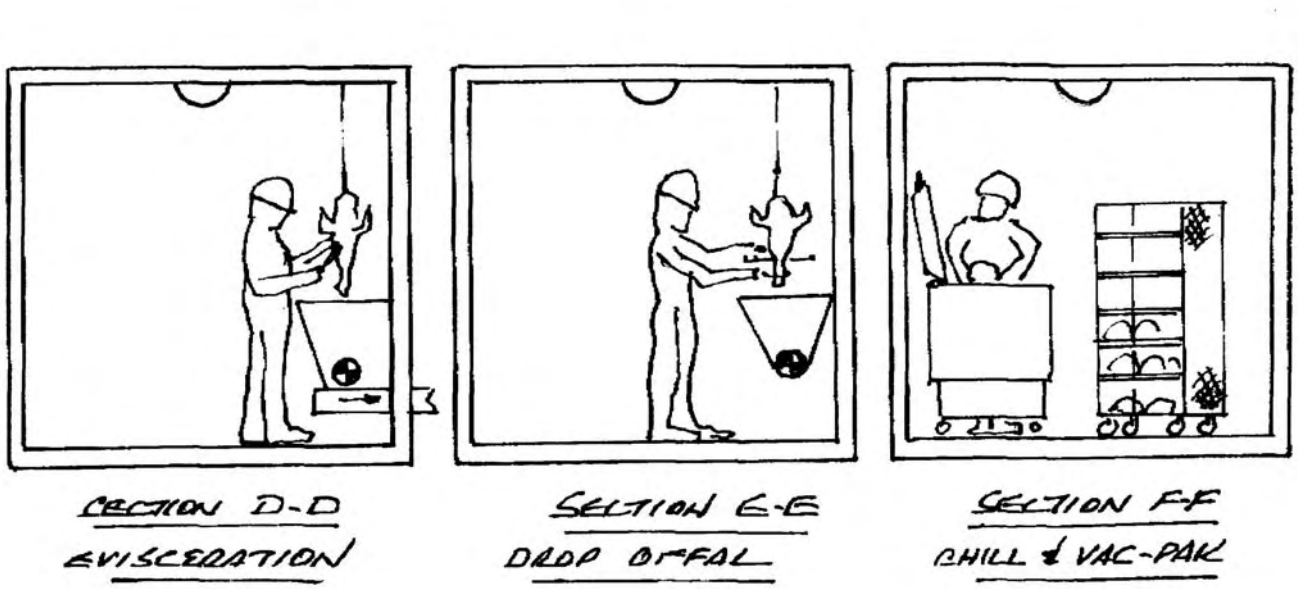
Price Includes:

2 – 40ft. Containers
1 – 20ft. Container
Reverse Osmosis Water System (24 hour)
Refrigeration – 680 kg/hour
Plumbing
Insulation
Bleeding Equipment
HVAC
Offal Pack
Scalding Area
Carcass Cleaning
Evisceration (manual)
Freezing
Packaging
Boiler

Poultry Processing – Bleed Out Section

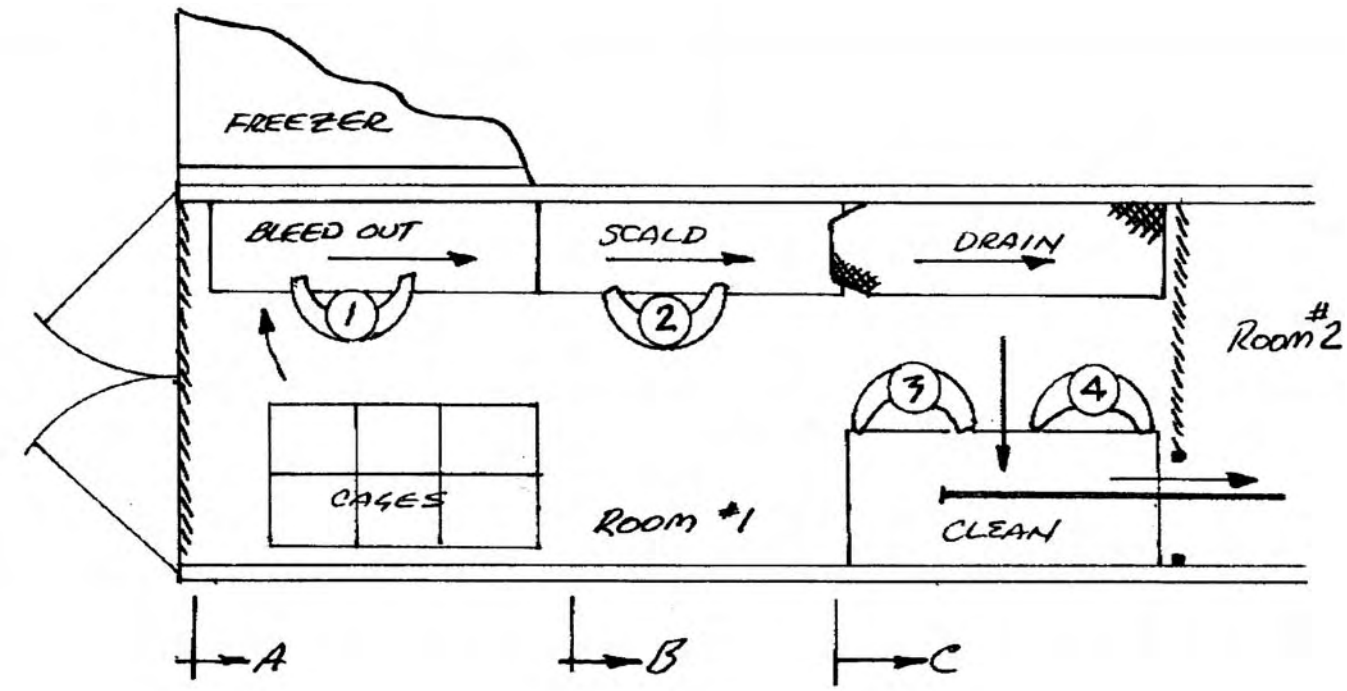


Poultry Processing – Viscerating Section

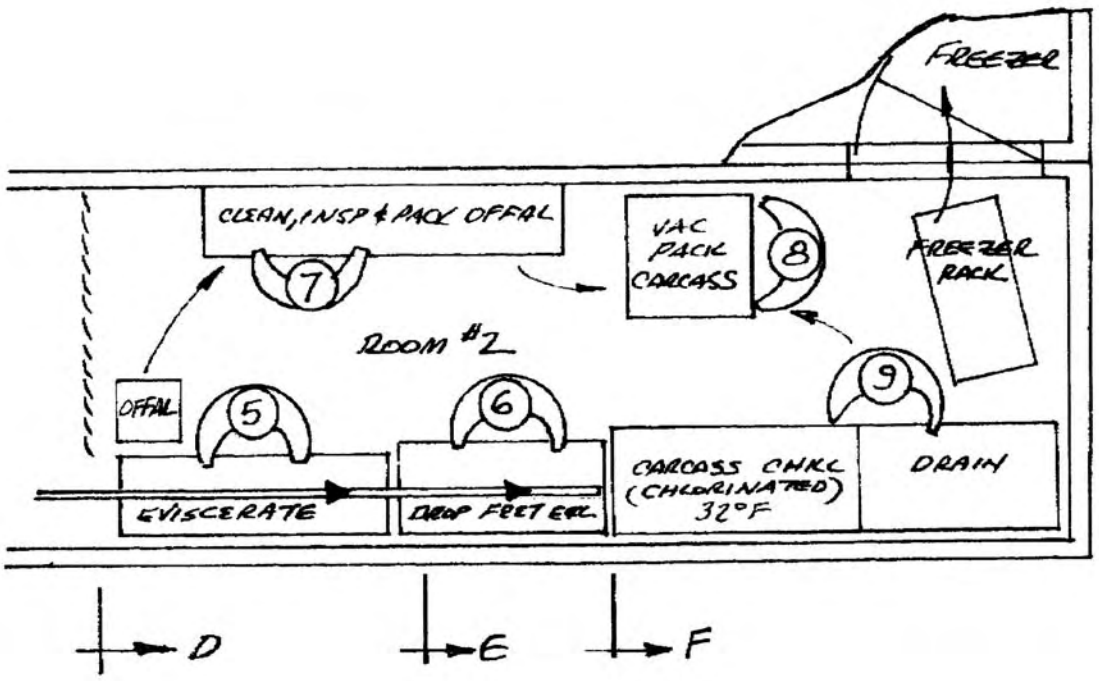


SCALE 3/8"=1'-0"

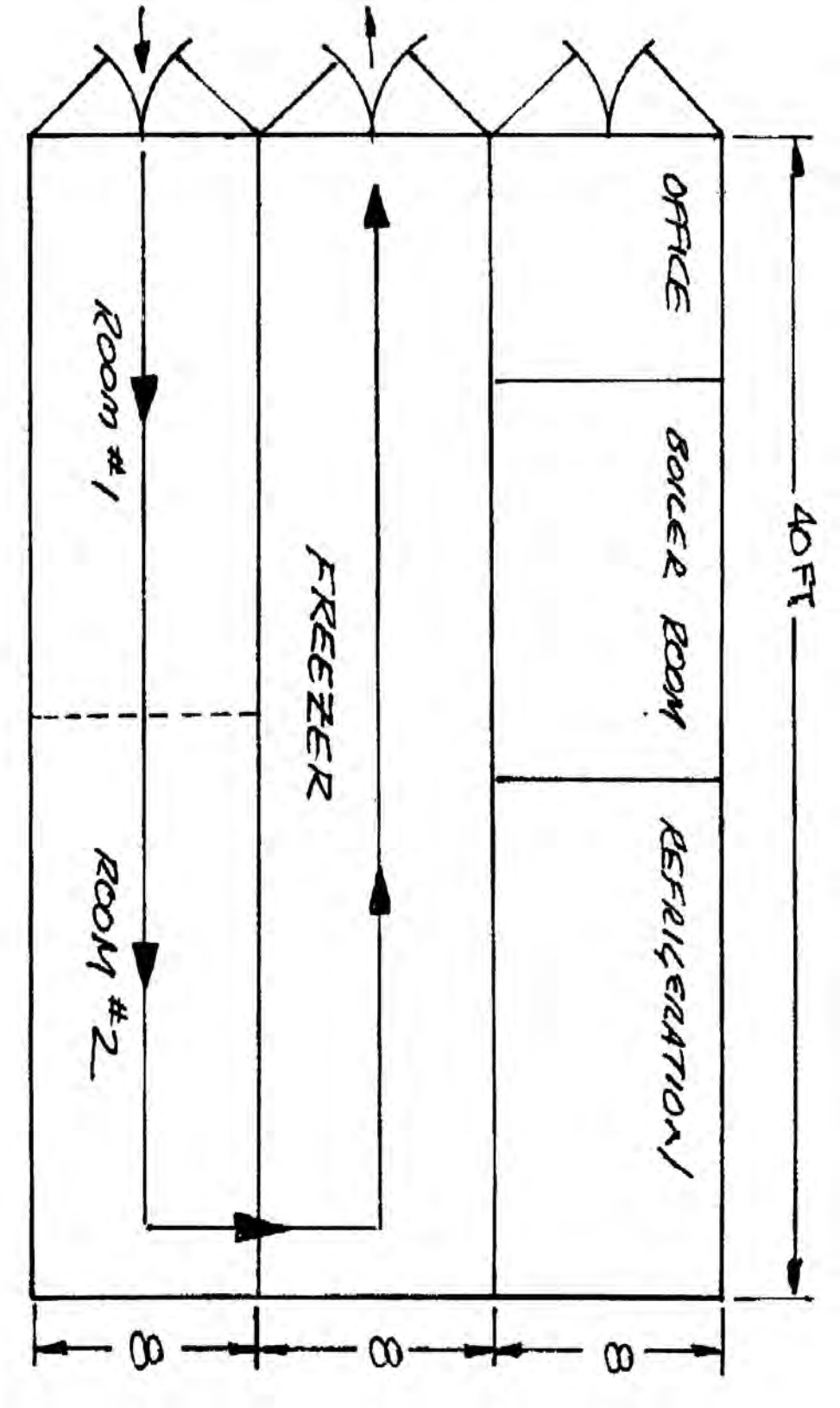
Poultry Processing – Bleed-Out & Cleaning Section



Poultry Processing – Cleaning, Inspecting and Packing Section



Poultry Processing – General Layout


OFFICE
BOILER ROOM
REFRIGERATION
FREEZER
ROOM #1
ROOM #2
40 FT
8
8
8

Poultry Processing Cash Flow

The following cash flow is based on the following assumptions:

1) Direct labor at $ 2.00 per day U.S.
2) Utility rates @ $ .07¢ per KWH
3) Selling Price of frozen birds @ $ 1.65/kg.
4) Average carcass weight finished @ 1.5 kg.
5) Average live weight @ 2.5 kg.
6) Carcass yield = 60%
7) Live bird cost = $ .60 ¢ / kg.
8) Depreciation = 15 yrs. machinery and 30 yrs. Bldg.

SLAUGHTER FACILITY

	Yr 1 Q1	Yr 1 Q2	Yr 1 Q3	Yr 1 Q4	TOTALS
Operating Sales					
1200 birds processed per day	75,600	75,600	75,600	75,600	302,400
Gross Sales	$193,000	$193,000	$193,000	$193,000	$772,000
					$0
TOTAL CASH AVAILABLE (1 thru 10)	$193,000	$193,000	$193,000	$193,000	$772,000
Operating Expenditures					
Packaging	$ 20,250.00	$ 20,250.00	$20,250.00	$ 20,250.00	$ 81,000.00
Feezing	$ 4,000.00	$ 4,000.00	$ 4,000.00	$ 4,000.00	$ 16,000.00
Utilities	$ 4,000.00	$ 4,000.00	$ 4,000.00	$ 4,000.00	$ 16,000.00
Maintainence	$ 3,000.00	$ 3,000.00	$ 3,000.00	$ 3,000.00	$ 12,000.00
Manager	$ 2,600.00	$ 2,600.00	$ 2,600.00	$ 2,600.00	$ 10,400.00
Supervisors (2)	$ 2,600.00	$ 2,600.00	$ 2,600.00	$ 2,600.00	$ 10,400.00
Direct Labor (8)	$ 2,600.00	$ 2,600.00	$ 2,600.00	$ 2,600.00	$ 10,400.00
Start-up Supervision	$ 40,000.00				$ 40,000.00
Supplies	$ 2,500.00	$ 2,500.00	$ 2,500.00	$ 2,500.00	$ 10,000.00
Building Depreciation	$ 2,000.00	$ 2,000.00	$ 2,000.00	$ 2,000.00	$ 8,000.00
Machinery Depreciation	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 30,000.00
Freight in-bound	$ 2,500.00	$ 2,500.00	$ 2,500.00	$ 2,500.00	$ 10,000.00
Freight out-bound	$ 6,125.00	$ 6,125.00	$ 6,125.00	$ 6,125.00	$ 24,500.00
					$ -
					$ -
					$ -
					0
TOTAL CASH REQUIRED (12 thru 38	$99,675	$59,675	$59,675	$59,675	$278,700

APPENDIX 7

REFERENCES CONSULTED

Afghanistan Alternative Livelihoods Program/South (ALP/S) Chemonics International, Inc. Washington D.C. Oilseed Production Assessment October 2005

RAMP Helmand Market Assessment – USAID contract No. 306-C-03-00-00502-00 – Kabul Afghanistan – August 2003

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