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Livestock-Protein Value Chain Interim Activity Report

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Interim Activity Report

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TABLE OF CONTENT

EXECUTIVE SUMMARY	1
INTRODUCTION	2
SCOPE OF WORK	4
EVALUATION OF THE LIVESTOCK HARVESTING AND MEAT PROCESSING INDUSTRY IRAQ	5
RECOMMENDATIONS FOR THE DEVELOPMENT OF NEW LIVESTOCK HARVESTING, MEAT PROCESSING FACILITIES AND RETAIL MEAT MARKETS IN IRAQ	6
RECOMMENDATIONS ON ADDING VALUE TO MEAT AND MEAT BYPRODUCTS	8
SMALL SCALE LIVESTOCK HARVESTING FACILITY DESIGN	9
SMALL SCALE MEAT PROCESSING FACILITY DESIGN	9
SMALL SCALE RETAIL MEAT SHOP DESIGN.....	10
EQUIPMENT COST ESTIMATES	11
Livestock Harvesting Facility Equipment Costs	12
Meat Processing Facility Equipment Costs.....	14
Retail Butcher Shop Equipment Costs	16
RECOMMENDED MANAGEMENT STRUCTURE.....	16
Fully Vertically Integrated Livestock Harvesting Facility, Meat Processing Facility and Retail Butcher Shop Management Structure	16
RECOMMENDED STAFFING LEVELS	19
RECOMMENDATIONS ON FEES AND MARKUP	20
PROPOSED TRAINING OUTLINES	21
Meat Retail Butcher Shop Staff Training – 6 weeks (4 weeks of meat cutting training for butchers)	23

Meat Retail Butcher Shop Owner Training- 1 week.....	23
Ministry of Agriculture Meat Inspector Training.....	23
TECHNICAL ASSISTANCE PROVIDED TO FEEDLOT OWNERS AND RED MEAT ASSOCIATIONS.....	24
TECHNICAL ASSISTANCE IMPACT.....	27
Immediate Impacts.....	27
Anticipated Impacts	27
RECOMMENDATION FOR FUTURE TECHNICAL ASSISTANCE.....	28
CONCLUSION	30
APPENDIX A: LAMB & BEEF VALUE CHAIN	32
APPENDIX B: LIVESTOCK HARVESTING FACILITY.....	33
APPENDIX C: LIVESTOCK PROCESSING FACILITY	34
APPENDIX D: SMALL BUTCHER SHOP.....	35
APPENDIX E: BEEF CUTS	36
APPENDIX F: LAMB CUTS.....	37
APPENDIX G:	38

Executive Summary

This report covers an evaluation of the current status of the livestock harvesting and processing industry, with an eye to providing technical assistance to the nascent meat harvesting and processing industry just beginning to emerge up in Iraq. USAID-*Inma* has been providing support to 10 feedlots in various areas of Iraq and technical assistance to others who wish to replicate the feedlots demonstrated. These feedlots are producing high quality meat animals, which should command a higher price in the market in Iraq. In order to do that a new meat processing industry needs to be developed to meet higher standards for sanitation, storage, and new technology for producing higher value cuts of meat and new processed meat products such as sausages, smoked meats, ready to cook meats and dried meats. This report makes recommendations and provides designs and cost estimates for building and equipping livestock harvesting facilities, meat processing facilities and retail butcher shops which can be owned and managed by feedlots, associations or private companies in order to vertically integrate along the value chain. This report recommends a series of trainings, which should be required for staff in each facility. The current market of high quality meat products in Iraq is discussed and a pricing structure of new meat products is recommended. Direction is provided to USAID-*Inma* on the next steps the project should take to facilitate the development of the meat processing industry in Iraq.

Introduction

At the present time there is very little value adding activity in the meat industry of Iraq. The few processed meat products that are available in the market are nearly all imported. Local meats that are sold in Iraq have quality, sanitation and food safety issues because they are processed using methods that have not been updated in the past 50 years. Approximately 50% of lamb and beef carcasses are slaughtered in government owned and controlled slaughter facilities¹. These slaughter facilities have many sanitation and food safety problems². There is an equal percentage of locally slaughtered meat that reaches the market³. Once killed skinned and eviscerated whole lamb carcasses and beef quarters are transported to local butcher shops and supermarkets. Some Butchers do their own slaughter at their shops, keeping a few sheep nearby and slaughtering as needed for the day.⁴ Small local meat shops are characterized by unwashed, unsanitized carcass hooks, wooden chopping blocks and axes or knives which hack the meat into undefined chunks of meat that often includes hair, rancid bits of fat from days past and bone splinters. Local butcher shops may be unwashed wooden stalls or brick kiosks lacking even air-conditioning to cool the meat products. Local butcher shop floors may be dirt or porous cement into which months or years of meat scraps, blood, fat and tissue have been trampled and imbedded. In some cases the meat vender does not even have a shop but hangs the carcass in a tree or on a post and hacks away chunks of meat at each customer's request. Supermarkets in towns and cities present a somewhat better meat product, but issues of sanitation and quality remain. Supermarket meat cutting⁵ is characterized by untrained meat cutters wearing dirty aprons or street clothes and open toe shoes or sandals, cutting or chopping undefined, un-standardized chunks of meat and bone on unwashed wooden or rusty metal tables, and offering the unwrapped meat for sale in unrefrigerated display cases that have not been washed or sanitized for many days. The only differentiation of meat cuts in Iraqi supermarkets currently is with-bone and without-bone.

This livestock harvesting assignment was the first of its kind for the United State Agency for International Development-*Inma* Project. Ten livestock feedlots were constructed during late 2009 and early 2010 and are operational. These feed lots currently sell live animals to buyers for butcher shops and supermarkets who then contract the slaughtering of the animals. In some cases the feedlots have the animals slaughtered in the state controlled slaughter facility and sell the carcasses to the buyers, and three of the feedlots have opened small butcher shops, Al-Qosh, Bartillah and Dahuk. In order to vertically integrate within the livestock-protein value chain several of the feedlots are investigating the possibilities to build their own livestock harvesting facility where they could harvest their own animals for sale as carcasses and byproducts. This harvesting facility could also contract harvest for other feedlots or other livestock farmers in the area. The livestock harvesting facility would then supply carcasses to

¹ According to the " Law on General Slaughtering" #105 enacted in 1989 all meat in Iraq is to be slaughtered in government owned or controlled slaughter facilities

² The consultant observed government slaughtered carcasses contaminated with bits of hide, hair, stomach contents, fecal matter, dirt and grease arriving at supermarkets in Erbil Iraq,

³ The consultant observed this in Baghdad and Kurdistan.

⁴ Agribusiness Project, Butcher Focus Group in Diyala, Final Report, Iraq Center for Research & Strategic Studies, Al-Jaderiyah, Baghdad, Iraq, 2007

⁵ The consultant observed this in Erbil and was told by local Inma staff that this is the same condition in Baghdad.

their own processing facilities where carcasses would be broken down into more valuable wholesale cuts for marketing to hotels and restaurants or further processed into sausages and cold cuts for wholesale to shops, restaurants, hotels and supermarkets. The final step, which would more fully vertically integrate the feedlot, would be for the feedlot to then open retail butcher shops where carcasses could be broken down into high value retail cuts and where the sausages, jerky and smoked meats produced by the processing facility could be sold at retail prices. At this time the feasibility of building and operating a livestock harvesting facility (slaughter plant) is not clear as there is currently a law requiring all livestock slaughtering in Iraq to be done in state owned and controlled slaughter facilities. There are, however, outside of the traditional small slaughtering operations mentioned at the start of this report, several examples of medium size livestock harvesting facilities that currently operate in Iraq. This first step in vertical integration is described in this report and plans were drawn for an appropriately sized livestock harvesting facility, but full recommendations for building and operating this facility will await clarification or modification of the law to allow for state licensed private businesses to own and operate such facilities, meeting all national standards for meat inspection. As current legal registration of a livestock harvesting facility may take a long time, requirements and registration procedures seem to be complex and not well defined and because the registration procedure may be expensive this report will leave the choice to build and register such a facility to those feed lots willing and able to negotiate the complex Iraqi registration system.

This consultation was limited due to security issues to working with three feedlots in North Iraq and two feedlots in South Iraq. Each of these five feedlot owners wishes to open their own slaughter and processing facilities. Beyond the government control problem already mentioned there are two additional problems with this concept. The first problem is that one feed lot can not supply enough animals on a daily basis to keep a small livestock harvesting and processing facility operating at full capacity. This problem could be overcome if a single feedlot owned livestock harvesting facility harvests animals for other feedlots in the region and for local farmers on a fee for service basis to fill the unmet capacity. The second problem is that not every feedlot owner has the capital required to build and operate a livestock harvesting facility, let alone to take the additional steps of building and operating a processing facility or opening a retail shop. This problem can be overcome, as already mentioned, if feedlots that can not afford their own facilities could contract process their animals in a meat processing facility in their region. A second alternative would be for feedlots in a region to join together in association to build one harvesting and one processing facility. Feedlot owners could then open their own retail butcher shops in towns and cities of their choice or they could market directly from the processing facilities as an association. At this time feedlot owners are reluctant to form associations so this presents an additional hurdle to building efficiencies in the livestock-protein value chain.

Due to the current reluctance among feedlot owners to form associations it is recommended that one livestock harvesting and one processing facility be built in cooperation with one well capitalized feedlot whose owner is willing to negotiate the complex registration system, and that at least one retail meat shop be opened to test the profitability of such a new concept in Iraq. In order to insure that the best possibility for profit exists for this proposed vertically integrated value chain this report proposes designs for small, appropriately sized livestock harvesting facility, meat processing facility, and a small retail butcher shop. This report discusses the associated costs of equipping and running each of these facilities as well as discussing the daily number of animals required to keep these facilities operational and

profitable. In addition this report provides training outlines for the owner and staff of each separate facility. These properly built and managed facilities with well trained workers will provide higher value, sanitary and safe meat products to Iraqi consumers. They will also set the bar high for quality production for those who may wish to replicate such facilities in the future.

Scope of Work

This report provides the following deliverables requested in the Livestock Harvesting Scope of work:

- An evaluation of the livestock harvesting and processing industry in the areas of Iraq where project established livestock feedlots currently operate;
- Estimate the potential and likely daily number of animals available for processing in areas surrounding project feedlots;
- Make recommendations based on sustainable business principals for the development of new livestock harvesting, meat processing and retail meat markets in Iraq;
- Make recommendations on improving value adding activities for meat and meat byproducts;
- Make recommendations for the design of a livestock harvesting facility in Erbil and possibly in Babil and Baghdad;
- Make recommendations for the design of a small meat processing facility in Erbil and possibly in Babil and Baghdad;
- Prepare cost estimates for equipment for the designed livestock harvesting, meat processing facilities and for a small meat retail shop;
- Recommend a management structure for a small scale livestock harvesting facility, processing facility and retail meat shops;
- Recommend staffing levels for a small scale livestock harvesting facility, processing facility and retail meat shops;
- Based on sustainable business principals make recommendations on fees, charges, and markup required for each livestock harvesting and processing facility and retail meat shop to fully recover costs of operation, including maintenance and provide a profit in order to ensure long term sustainability;
- Recommend outlines for training programs for a livestock harvesting facility, a meat processing facility, for meat retail shops and for MOA met inspectors;
- Provide technical assistance to feedlot owners and red meat associations;
- Propose any future technical assistance that will be required to supervise construction of a livestock harvesting facility, a meat processing facility and meat retail shops;
- Propose any future technical assistance that will be required for training.

Evaluation of the Livestock Harvesting and Meat Processing Industry Iraq

Several studies have been done and a few pilot livestock harvesting and meat processing projects have been attempted in Iraq in the last 5 years. A study of The Potential for Food Processing in Iraq⁶ was written in 2006. This report had a brief section on the potential for meat processing, but advocated only the development of a poultry processing industry based on the low per capita consumption of 4.5 kg of red meat at that time. Since then the per capita consumption of red meat in Iraq increased to 6.5 ⁷kg reported in 2007. In 2008, the Initial Red Meat Value Chain Assessment⁸ predicted that meat consumption in Iraq would increase at a rate of 12% annually and would double over the next 5 years. The report noted at that time that fresh premium quality meat had the greatest value adding potential and was the fastest growing segment of consumption and should be selected for technical interventions. In 2009 Dr. Tony Laos reported in the Meat Trade Daily News⁹ that the USAID-*Inma* project was planning to address the meat processing issue and establish a more modern and widely acceptable meat handling system with improved meat processing equipment and operational systems. This Activity report is the next step in that plan. In November 2009 it was reported that the U.S. Army Corps of Engineers (USACE) was renovating the Nasiriyah Meat Processing Plant with an investment of \$2.5 million. That renovation was reported to include ancillary buildings for meat byproduct processing, meat chillers, a waste treatment unit and a new water supply system as well as a set of processing equipment and some rehabilitation of the interior of the facility¹⁰. At this writing inquiries concerning this facility have revealed that this facility is still under construction. In March 2010 it was reported that the U.S. Army Corps of Engineers Gulf Region District, Kirkuk Resident Office had served as the management partner for construction of a \$1.1 million meat processing facility at Qadzilla, high in the mountains of the northern Kurdish region.¹¹ The operation was reported to be fully operational in March 2010 and had been provided with a waste disposal system, two crematories to dispose of waste products, a tannery on site to process skins, and walk in freezers to hold meat awaiting shipment to local butcher shops and grocery stores. From the description provided in this report it seems that the Qadzilla facility was actually a livestock harvesting facility rather than a processing facility. This consultant made efforts to contact both of these facilities in order to hear about lessons learned which could be incorporated into these plans and this report, but was unable to learn more than was reported in the North Shore Journal.

USDA-FAS reported in September 2009¹² that Iraq imported much of its food. The US exported to Iraq \$77 million in meat and poultry in that year. Brazil's export of meat, mostly

⁶ USAID/IIRAQ IZDIHAR project report March 15, 2006

⁷ Source: COSIT,FAO and the World Bank 2007

⁸ May 5, 2008 USAID-*Inma* Agribusiness Program Report

⁹ December 20, 2009, www.meatradenewsdaily.co.uk

¹⁰ "Nasiriyah Meat Processing Plant Renovations", November 9th, 2009, <http://northshorejournal.org/nasiriyah-meat-processing-plant-renovations>

¹¹ "USACE provides modern meat processing plant for northern Iraq, March 11, 2010, <http://northshorejournal.org/nasiriyah-meat-processing-plant-renovations>

¹² Investing in Iraqi Agriculture: Challenges and Opportunities , U.S.- Iraq Business and Investment Conference, October 20-21, 2009 report

chicken, to Iraq more that doubled from \$107 million in 2008 to \$250 million in 2009¹³ with direct exports reported at 313 million pounds. The Brazil-Iraq Chamber of Commerce reported that indirect exports, through a third country, usually Kuwait were 2/3 again as much as direct exports. These figures show that the Iraqi demand for meat is increasing as the security situation becomes more stabile, prices for meat decrease and incomes rise. This increased demand shows that potential for profitability of the proposed meat processing and marketing facilities is good.

In order to determine the appropriate size of livestock harvesting and meat processing facilities to design it is necessary to determine the potential and likely daily number of animals available for processing in the areas surrounding project feed lots. The Government of Iraq owns the Dahuk Government Slaughter Facility. In the low season of the year this facility slaughters 100 lambs per day and 15 beef per day. In the high season of the year this facility slaughters 200 Lambs per day and 60 beef per day. This facility slaughters animals supplied by the Dahuk feedlot and supplied by local farmers in the province. From this number Dahuk feedlot currently takes 20 lamb carcasses per day and two beef to be cut into wholesale and retail cuts in the Dahuk feedlot owned Blann Butcher Shop.

It has been reported by reliable sources that at the same time an equal number of livestock is slaughtered outside of the government controlled slaughter facility. These animals are slaughtered by traditional methods for home consumption and also supplied to the local market. Thus the total potential number of animals available for harvest can be projected to be approximately 69,000 head of beef and lamb per year at the low rate and 138,000 head per year at the high rate. However, it is not known how many of those traditionally slaughtering farmers or meat shops could be attracted to pay fees to have their animals harvested in a new modern clean, sanitary livestock harvesting facility, thus this report will take the currently working state controlled facility as an indicator of the likely number of animals that would be available for processing in areas surrounding other project supported feedlots. It should be noted as a caution here that different areas will have different distributions of livestock raised; some areas will have higher numbers of sheep while other areas will higher concentrations of beef. These livestock populations will have an effect on the total number of animals available for slaughter each day through a small size harvesting or processing facility.

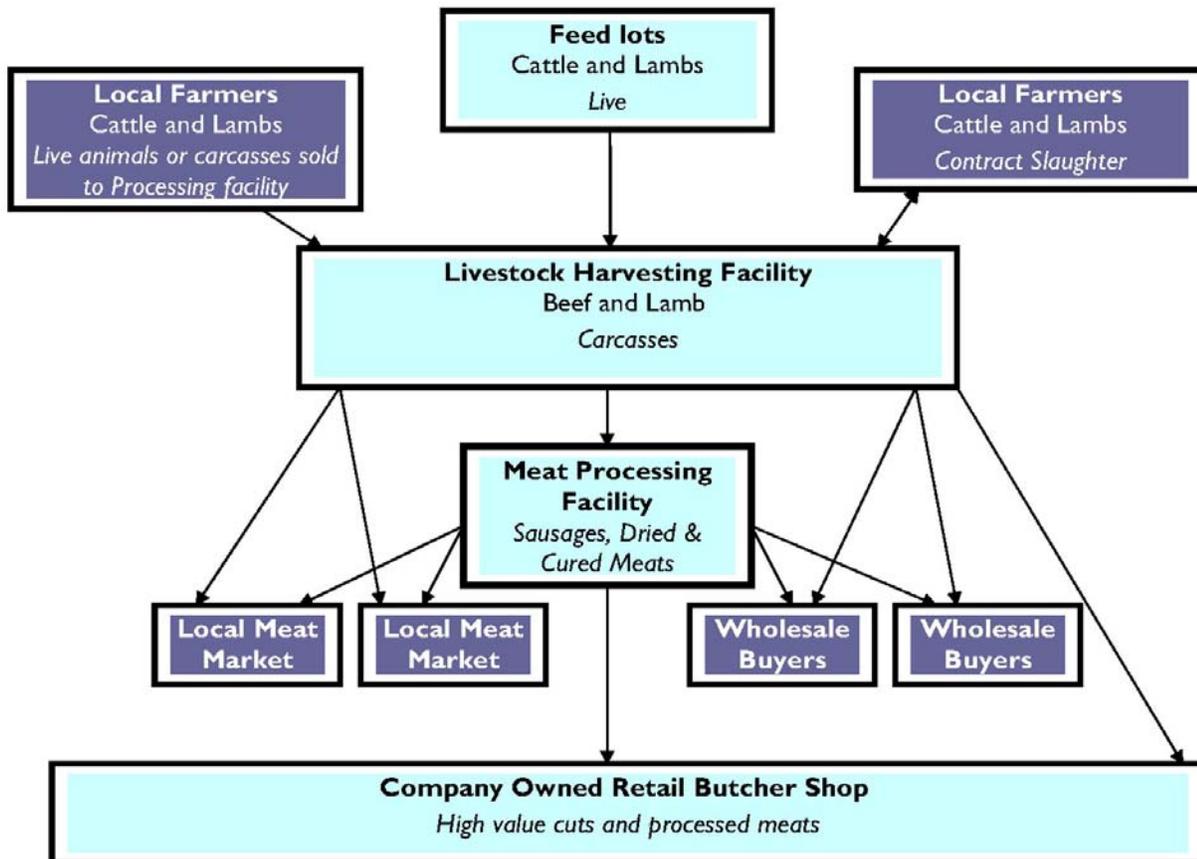
Recommendations for the Development of New Livestock Harvesting, Meat Processing Facilities and Retail Meat Markets in Iraq

Owners of the five livestock feedlots assisted under this scope of work all desire to open their own livestock harvesting, processing and marketing facilities. They desire to vertically integrate and begin to provide value added meat and meat byproducts to the market in their areas. While this may be possible for one or two well capitalized feedlot, not every feedlot can currently afford to build its own facilities. Another alternative would be for livestock harvesting, meat processing faculties and retail meat markets to be built and managed by several feedlots working in collaboration as an association, cooperative, or a partnership owned

¹³ Meat Trade Daily News February 2010, http://www.meatradenewsdaily.co.uk/news/160210/brazil_chicken_meat_for_iraq.aspx

company. A third alternative would be that new livestock harvesting facility, meat processing facility and retail butcher shops could be built and managed privately by companies entirely independent of the feedlots. The scenario discussed in this report assumes that the ownership will be a single feedlot owned, vertically integrated structure. However all calculations and recommendations will be equally valid for any of the other alternative ownership structures mentioned above. For orientation purposes a livestock harvesting facility, processing facility and butcher shop sales flow chart is provided below. This flow chart shows livestock moving from feedlots and from local farmers through the value chain ending as high value meat products to be purchased by end consumers. This chart is a simplified revision of the original USAID-Inma Lamb and Beef Value Chain Chart. *Appendix A*

Livestock Harvest, Processing and Sales Flow Chart



Recommendations on Adding Value to Meat and Meat Byproducts

While there is an enormous range of value added products that could be developed for the Iraqi market it is recommended that initially the owners of a new meat processing facility make the following products:

- Hamburger patties
- Meat balls
- Pizza toppings such as seasoned ground lamb and seasoned ground beef
- Fresh stuffed sausages - breakfast style, Italian, German and Polish styles of bratwurst
- Smoked sausages – pepperoni, salami and German and Polish styles of smoked sausages
- Dried meats such as beef jerky
- Ready to cook marinated beef and lamb products

These meat products could be offered to the market as fresh, frozen, smoked, or cured.

An additional method to gain value from the harvesting of livestock for meat is to utilize the edible and inedible byproducts in such a way that nearly every part of the animal can be sold to create profit for the owner. The livestock harvesting facility would handle and process the inedible product such as hides and skins, blood, bone and stomach contents. Hides can be sold for leather manufacture, the remainder can be ground and composted or rendered and sold for chicken or fish feed or fertilizer. Edible byproducts include the heart, liver, kidneys, stomach, intestines, head, feet, lungs and fat. Some of these byproducts could be used in the sausage making process and the remainder could be sold directly to consumers through the retail butcher shops.

In order to add value to beef and lamb carcasses the processing facility will need to procure various types of specialized equipment that will grind, mix, stuff into casings, form patties, cube, cook, smoke, vacuum seal in plastic and freeze meat. A complete list of equipment requirements for the processing plant is included in this document. Procuring this equipment will require quite a bit research on quality and availability as well as cost comparisons as this will represent a significant investment by the owner. The investment in this equipment will be recovered from the profits of the facility. Assuming that the owner does not have to finance the purchase with a loan, the initial investment in processing equipment could be recovered over a five year period at the rate of approximately \$18,600 per year.

Small Scale Livestock Harvesting Facility Design

Detailed plans were drawn up for a small scale livestock harvesting facility with a maximum daily slaughter capacity of 60 lambs and 20 beef, taking into account that the facility would require the following:

- Animal intake and holding areas
- Hygienic slaughter and butchering area
- Chilling unit
- Provision of clean water for operational functions
- By-product handling, storage, and disposal equipment
- Waste product handling and disposal equipment
- Waste water handling equipment
- Supply Storage area
- Employee toilets and showers
- Halal slaughter area

The design is included as Appendix B

It is recommended that the cost of construction of this facility be the responsibility of the feedlot owner. At this time no construction cost estimates are supplied. It is believed that nearly all required construction materials and food safe interior finishing can be procured in Iraq, thus the feedlots will be able to perform their own cost estimates for construction based on local market prices for construction and finishing materials.

It is recommended that a livestock harvesting facility construction specialist be hired to oversee the construction of the facility in order to assure that the design is followed, all rooms are finished with food safe materials, all process lines and cooling rooms are installed in a manner that will meet international standards, and that all waste handling facilities, are properly installed and operating in a manner that will assure safe food products are produced by the facility and waste products are disposed of in a manner that will protect the environment.

Small Scale Meat Processing Facility Design

Detailed plans were drawn up for a small scale meat processing facility with a maximum daily capacity to break down 20 beef or 60 lambs and 10 beef per day and make a maximum of 250 pounds of sausage per day, taking into account that the facility would require the following:

- Hygienic meat processing area
- Cooler units for incoming product
- Cooler units for finished product
- Provision of clean water for operational functions
- Waste product handling and disposal equipment
- Waste water handling equipment
- Supply storage
- Employee toilets and showers

The design is included as Appendix C

It is recommended that the cost of construction of this facility be the responsibility of the feedlot owner. At this time no construction cost estimates are supplied. It is believed that nearly all required construction materials and food safe interior finishing can be procured in Iraq, thus the feedlots will be able to perform their own cost estimates for construction based on local market prices for construction and food safe finishing materials.

It is recommended that a meat processing facility construction specialist be hired to oversee the construction of the facility in order to assure that the design is followed, all rooms are finished with food safe materials, process lines and cooling rooms are installed in a manner that will meet international standards, and that all waste handling facilities, are properly installed and operating in a manner that will assure safe food products are produced by the facility and waste products are disposed of in a manner that will protect the environment.

Small Scale Retail Meat Shop Design

Detailed plans were drawn up for a small scale retail butcher shop taking into account that the facility would require the following:

- Customer service area
- Retail sales area
- Provision of clean water for operational functions
- Refrigerators and coolers
- Meat cutting area

The design is included as Appendix D

It is recommended that the cost of construction of this shop be the responsibility of the owner. At this time no construction cost estimates are supplied. It is believed that nearly all required construction materials and interior finishing can be procured in Iraq, thus the feedlots will be able to perform their own cost estimates for construction based on local market prices for construction and finishing materials.

It is recommended that a specialist be hired to oversee the construction or renovation of the butcher shop in order to assure that the design is followed, all rooms are finished with food safe materials and all tables, meat cases and coolers are installed in a manner that will assure food safety to customers.

Copies of the three plans above were provided to the feedlots: Taji, Dahuk, Bartillah, Al-Qosh, and Hawks of Iraq in Babel. Three of these feed lots currently operate small butcher shops, Al-Qosh, Bartillah and Dahuk. Of the three Al-Qosh and Bartillah are village level shops with limited volume, while Dahuk operates at a much higher level currently selling meat from about 50 lambs and 5 beef per week direct to restaurants and hotels and about 47 lambs and 2 beef per week as retail cuts through the Blann Butcher Shop.

Equipment Cost Estimates

Below is the recommended **Livestock Harvesting Facility Equipment list** and an approximate cost for the equipment. The size of equipment in this list will allow the facility to harvest up to 60 lambs per day and up to 20 beef per day if operating at maximum capacity. The following calculations show the potential income that would be generated for the harvesting facility if the plant could operate at a more likely average daily rate of 48 lambs and 20 beef per day for a year;

48 lambs per day X 6 days per week = 288 lambs per week X 52 weeks = 14,976 lambs per year
Lamb slaughter fee and wool & hide sales will yield approximately \$12 per head X 14,976 lambs =
\$179,712.00 income per year from lamb slaughter

20 beef per day X 6 days per week = 120 per week X 52 weeks = 6240 beef per year
Beef slaughter fee and hide sales will yield approximately \$43 per head X 624 beef =
\$268,320.00 income per year from beef slaughter

With this projected income it is believed that the capital equipment costs could easily be recovered in five years at a rate of \$3,560 per year.

This equipment will perform the following functions: killing, bleeding, skinning, trimming, washing and sanitation.

It is recommended that a specialist be hired to assist the owner with equipment selection and installation and then train all staff on operation, cleaning and products that can be produced by each piece of equipment.

Livestock Harvesting Facility Equipment Costs

Equipment name	Number needed	Approximate Total Price	Dimensions
Splitting saw	1	\$1,500	
Spreader bar	60 pieces	\$50	
Trolley	60 pieces	\$500	
Metal rails and hangars	200 feet	\$1,000	
Wrapping machine and plastic	1	\$300	
Carcass scale	1	\$300	
Small printer scale- 30 pounds	1	\$500	
Knives, sharpening stones, steels, and hooks	Varies on number of butchers	\$600	
Older grinder for stomach and intestines	1	\$500	
Used grinder	1	\$1,000	
Cuber	1	\$3,500	
Stainless steel table with cutting boards	2	\$500	6'
Stainless steel band saw (medium)	1	\$2,500	
Stainless table with 3 compartment sink	1	\$400	6'
Stainless table with 3 compartment sink	1	\$600	12''
Hoist	1	\$600	
Skinning cradle	3	\$500	
Squeegee	3	\$60	
Hot hoses (50 feet each)	3	\$500	
Wall mount sink	1	\$500	
Knife sterilizer	1	\$150	
White board	1	\$200	
Medium hot water power washer	1	\$1,400	
Meat tubs	20	\$200	
Total-minimum		\$17,800	

Below is the recommended **Meat Processing Facility Equipment list** and an approximate cost for the equipment. This equipment will allow the facility produce products for wholesale accounts such as restaurants, hotels, butcher shops and small supermarkets. In addition to sausages and jerky the facility will breakdown lamb carcasses and beef halves into semi-primal cuts for wholesale buyers. The following calculations show the potential income that would be generated for the processing facility if the plant could operate at a reasonable average daily rate 15 lambs, 3 beef and 250 pounds of sausage per day for a year;

15 lambs per day X \$80 per head =	\$7,200 per week
3 beef per day X \$100 per head =	\$1,980 per week
250 Lb sausages & jerky per day X \$1.50 per Lb =	\$2,250 per week
Total per week =	\$11,430
Total potential income per year =	\$594,360

With this projected income it is believed that the capital equipment costs could easily be recovered in five years at a rate of \$18,600 per year.

This equipment will perform the following functions: carcass breakdown, boning, grinding, mixing, stuffing, smoking, packaging, sanitation and cold storage.

It is recommended that a specialist be hired to assist the owner with equipment selection and installation and then train all staff on operation, cleaning and products that can be produced by each piece of equipment.

Meat Processing Facility Equipment Costs

Equipment name	Number needed	Approximate Total Price	Dimensions
Stainless steel tables	4	\$1,000	6' x 8'
Large grinder	1	\$5,000	
3 compartment sink	1	\$1,500	
1 compartment hand sink- floor mount	1	\$500	
Piston style stuffer	1	\$6,000	
Double chamber vacuum packer	1	\$8,000	
Stainless steel stuffing table	1	\$600	10'
Boning tables with white boards	2	\$600	
Truck smoke house	1	\$50,000	
Smoking sticks	15	\$400	
Meat saw (basically a saw used as wood band saw)	1	\$3,500	
Labeling scales	2	\$3,000	
Splitting saw	1	\$1,500	
Meat slicer	1	\$3,000	
Knife sterilizer	1	\$1,500	
Meat scales/printer	2	\$2500	
Boning knife	12	Total price for knives, steels, and hooks is \$600	6"
Boning steak knife	12		10"
Serrated knives	6		10"
Sharpening steels	6		
Scabbards	6		
Meat hook	6		
Trimming hooks	6		
Meat tubs	40	\$400	
Meat cuber/tenderizer	1	\$3,500	
Stainless sausage trucks	3	\$600	300 pounds
Wrapping machine	1	\$300	
Medium size hot water power sprayer	1	\$1,400	
Total-minimum		\$93,000	

Below is the recommended **Retail Butcher Shop Equipment list** and an approximate cost for the equipment. This equipment will allow the shop to sell 3 to 8 lambs per day and 1 to 2 beef per day, breaking the carcasses and halves or quarters down into retail consumer cuts.

The following calculations show the potential range of income that would be generated for the retail butcher shop if it could sell at these daily rates for a year;

Lower range of sales

3 lambs per day X \$80 per head= \$240 per day X312days=\$74,880

1 beef per day X \$110 per head= \$110 per day X312 days=\$34,320

\$109,200 per year income at lower range of sales

Higher range of sales

8 lambs per day X \$80 per head= \$640 per day X312 days=\$199,680

2 beef per day X \$110 per head= \$220 per day X312 days=\$68,640

\$275,184 per year income at higher range of sales

With this projected income it is believed that the capital equipment costs could easily be recovered in five years at a rate of \$4,382 per year.

This equipment will perform the following functions: carcass breakdown, meat cutting, meat grinding, meat slicing, refrigerated product display, washing and sanitation, and cold storage.

It is recommended that a specialist be hired to assist the owner with equipment selection and installation and then train all staff on operation, cleaning and products that can be produced by each piece of equipment.

Retail Butcher Shop Equipment Costs

Equipment name	Number needed	Approximate Total Price	Dimensions
Small band saw	1	\$2,000	
3 compartment sink	1	\$500	
Stainless meat cutting tables	1	\$1000	
Small meat grinder	1	\$2,000	
Meat tubs	6	\$60	
Meat Tenderizer	1	\$3,000	
Hot water heater	1	\$500	
Pricing scale	1	\$500	
Carcass scale	1	\$500	
Splitting saw	1	\$1,500	
Meat slicer	1	\$1,000	
Meat cuber	1	\$650	
Knives, steels, hooks, sharpening stones	1 set	\$400	
Hot wrap machine	1	\$300	
Lighted cold meat case	1	\$4,000	8 foot
Cooling unit for cooler	1	\$3,000	
Small power washer	1	\$1,000	
Total-minimum		\$21,910	

Recommended Management Structure

Fully Vertically Integrated Livestock Harvesting Facility, Meat Processing Facility and Retail Butcher Shop Management Structure

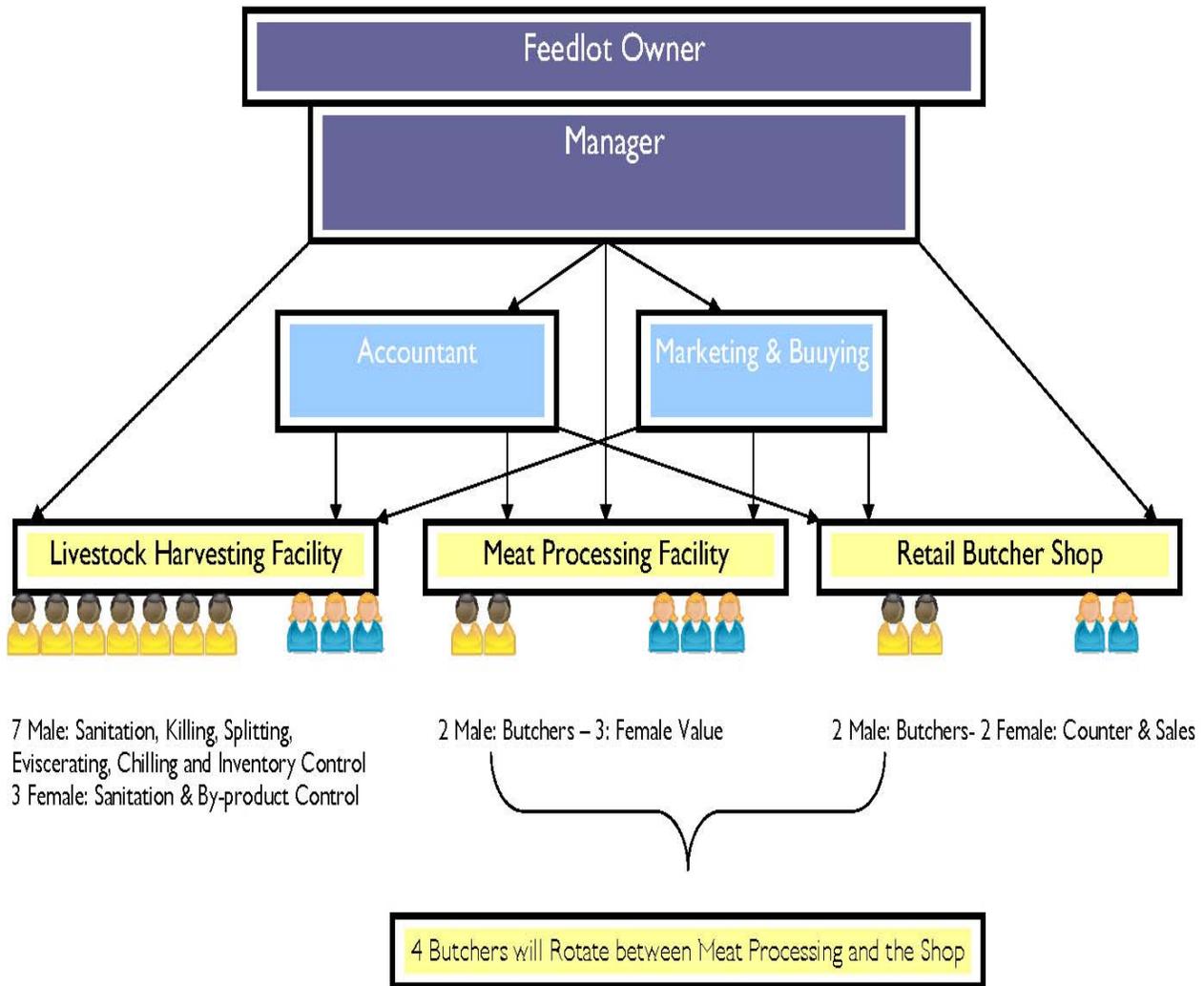
There are many ways that this livestock protein value chain can be structured and managed. It is proposed that one or several feed lots organize into an association or a company in order to retain ownership of their livestock and subsequently their meat all the way along the value chain. This will allow the feedlot owners to capture income and profits at each link in the value chain. This report recommends that a livestock harvesting facility, a meat processing facility and one or more meat retail shops be built and managed by a feedlot owner or an association of feedlot owners in each geographic area of Iraq.

The livestock harvesting industry is controlled as a monopoly by the MOA, even though nearly half of animals slaughtered in Iraq are slaughtered privately by individuals or small shops, it may be difficult or even impossible to build and operate an independently owned small to medium size livestock harvesting facility. Should this prove to be the case, feedlots could contract

slaughter of their animals in the State facility paying the slaughter fee, then transport the carcasses to their own meat processing facility, trim the carcasses, wash in 160°F., rinse with lactic acid and chill to 32° F. before breaking down into wholesale cuts and processing into sausage, ground meat products and jerky. After slaughter, some of the feedlot produced, better quality carcasses would bypass the processing facility and be transported directly to the retail butcher shops for where the same sanitation and chilling procedure would be followed before breaking down into high value retail cuts. The processing facility takes the remaining better quality carcasses for wholesale accounts, such as hotels and restaurants, and the less tender and older carcasses for processing into sausage. The processing facility would also market a proportion of their various sausage products through their own retail butcher shops while selling the rest wholesale to other grocery shops, restaurants and hotels.

The management structure diagramed below will work for either a single owner or an association as the owner. Each facility will be organized as a separate and independent business, accepting input and transferring output along the value chain accounting for all capital and operational costs specific to its operation. Each facility should generate a profit and not simply act only as a service to the overall ownership.

Livestock Harvest, Processing and Sales Management Structure



Recommended staffing levels

It is recommended that the **Livestock Harvesting Facility** described above begin operations at the following staffing level:

Owner/manager- 1- 1/3 time
Marketing/buying manager- 1- 1/3 time
Accountant – 1- 1/3 time
Laborers - Male- 7
Laborers - Female- 3

Meat Processing Facility recommended beginning staffing level:

Owner/manager- 1- 1/3 time
Marketing/buying manager- 1- 1/3 time
Accountant – 1- 1/3 time
Butchers –Male – 3
Sausage Makers – Female – 3
Sanitation Person – Female – 1

Retail Butcher Shop recommended beginning staffing level:

Owner/manager- 1- 1/3 time
Marketing/buying manager- 1- 1/3 time
Accountant – 1- 1/3 time
Butchers – Male – 2
Customer Service Persons – Female - 2

The owner/manager, marketing/buying manager and the accountant will split their time between the three facilities.

Recommendations on Fees and Markup

The livestock harvesting facility fees for beef and lamb are fixed by the Iraq government since most slaughter takes place in government controlled slaughter facilities. These charges are \$ 12 per lamb and \$43 per beef. It is recommended that the new facility use these same fees at start-up. Once clients and customers begin to recognize that carcasses produced in the independent livestock harvesting facility are cleaner and thus safer, and that the quality of product is not only higher but consistently higher the new facility will then be able to command higher fees for their services.

The meat processing facility fees for breaking down carcasses into wholesale semi primal cuts are projected to average about \$80 per head for lambs and \$100 per head for beef¹⁴. These semi primal cuts would be marketed to restaurants and hotels

While working with the feedlots a review of processed meat products currently offered in the market in Iraq revealed:

- Nearly all sausage products are currently imported;¹⁵
- The quality of the imported sausage is low and contains as much as 50-60% fillers such as chicken fat, chicken skin and soya;
- Imported sausage price is very low;
- Iraqi people interviewed do not prefer this low price sausage because it does not taste like beef or lamb;
- Iraqis who buy the imported sausage generally buy it as a replacement for better quality meats which they cannot afford;
- Examples of prices for imported meat products, January 2011;
 - Sausages (high percentage- filler) \$3.80/kg
 - Hamburger patties \$6.00/kg (\$2.72/lb)
 - Meat balls (high percentage- filler) \$5.50/kg (\$2.50/lb)

The sausage that will be produced by the proposed meat processing facility will be high quality made with beef and lamb meat and trimmings. High quality sausage will be able to sell for higher prices just like high quality retail cuts can sell for higher prices than undefined chunks of meat. The processing facility will be able to convert ground meat (current value for hamburger- ID 6,000 per kg) add seasonings and stuff into casings and retail the sausage product for ID 12,000per kg for bulk sausage. The profit margin will be higher when it is considered that many of the animals used to make sausage will be older animals, no longer used for breeding, which can be bought at very low prices. New sausage products will be introduced slowly to the Iraq market to test customer satisfaction and appropriate pricing levels. When customers consider that a high quality steak will cost ID 24,000 to ID 28,000 per kg, a high value, good tasting, and specialty sausage priced as high as ID 22,000 should be welcome on the market. Below are three examples of proposed products and proposed pricing. (Pricing is based on experience introducing similar products in many other countries)

- Bulk Sausage (fresh breakfast or Italian style) cost ID 6,000/kg
- Bulk Sausage (fresh breakfast or Italian style) sell ID 12,000/kg

¹⁴ These projected prices areas of December 2010 based on interviews with Dahuk feedlot owner who has already begun to vertically integrate.

¹⁵ Prices were supplied By Sally Port Dining Facilities Manager for this report January 20, 2011

- Sausage Link (fresh bratwurst or garlic-wurst) cost ID 6,000/kg
- Sausage Link (fresh bratwurst or garlic-wurst) sell ID 18,000/kg
- Smoked Salami (any other smoked sausage) cost ID 6,000/kg
- Smoked Salami (any other smoked sausage) cost ID 22,000/kg

The retail butcher shop markup will depend on many factors including the current meat prices in other markets, the variety of specialty meat cuts produced by the shop and customers' perception of the value of high quality and safe meats produced by the shop. It is believed that as a conservative estimate each lamb carcass cut into retail cuts will give the shop a markup value of at least \$80. Beef carcasses cut into retail cuts should give the shop a markup value of at least \$110.

Proposed Training Outlines

The first step in adding value to meat products available to the market in Iraq is training management and staff to recognize quality, and know how to add quality to the meat they are handling. This training can be broken down into several types. Sanitation and food safety should always be foremost in importance. These trainings can come directly from the Standard Sanitation Operating Procedures,¹⁶ Safe Food Handlers Training Manuals¹⁷ and HACCP¹⁸ training modules. Livestock harvesting staff will need to be trained to humanely handle and kill animals, to skin and eviscerate animals while maintaining sanitation and to maintain or improve meat quality through cooling of carcasses. In addition harvesting facility staff needs training in handling, processing and safe storage of meat byproducts. Meat processing facility butchers need to know how to break down carcasses into the custom wholesale cuts required by their customers. Sausage makers need to be trained in grinding, spicing, mixing, stuffing, curing, smoking, and packaging as well as temperature requirements for various products. Processing plant owners need to be trained and thoroughly understand all the concepts of packaging and brand image management for their meat products. Meat retail staff needs training on temperature, lighting and sanitation to retain meat quality once value added products reach their market. Meat cutters will need to be trained to break down beef and lamb carcasses into smaller primal cuts and then further break those primal cuts into high value retail cuts such as steaks, roasts and chops. Customer service training will be key to the success of the retail markets. Owners and managers will need to be trained in business management of these new facilities.

The first step to improving the quality of meats provided to the market and to adding value to the products put out by the proposed livestock harvesting facility, meat processing facility and the new meat retail shops will be a series of in-depth trainings. Below are the proposed training outlines for each of the three new links in the livestock protein value chain:

Livestock Harvesting Facility Staff Training - 2 Months class room and hands on training

- Proper shipping and transport of live animals
- Humane handling of livestock

¹⁶ www.fsis.usda.gov/pdf/ssop_module.pdf

¹⁷ www.oregon.gov/DHS/ph/foodsafety/manual.shtml

¹⁸ www.fsis.usda.gov/Science/hazard_analysis

- Humane slaughter
- Proper bleeding procedures
- Proper skinning procedures
- Proper evisceration procedures
- Carcass washing procedures
- Proper carcass trimming procedures
- Product handling- edible and inedible products
- Temperature requirements and cooling procedures
- Safe ageing or hanging procedures
- Sanitation
- Food safety
- HACCP basics
- Proper shipping and transport of carcasses

Livestock Harvesting Facility Owner Training – 1 week

- Business management
- Marketing
- Inventory Control
- Sanitation
- Food Safety
- HACCP basics

Meat Processing Facility Staff Training -4 months classroom and hands on training

- Proper product receiving procedures
- Re-trimming received product for sanitation
- Food safety
- Sanitation
- HACCP basics
- Safe handling of meats
- Byproduct handling
- Safe storage of meats
- Inventory control- storage loss prevention
- Halal processing and labeling
- Packaging of product
- Sausage making
 - Grinding
 - Spicing
 - Mixing
 - Stuffing
 - Cooking
 - Curing
 - Smoking
 - Packaging
 - Temperature requirements for various products
 -

Meat Processing Facility Owners Training – 1 week

- Brand selection and image management
- Packaging and labeling
- Business management
- Inventory Control
- Marketing

Meat Retail Butcher Shop Staff Training – 6 weeks (4 weeks of meat cutting training for butchers)

- Customer service
- Safe handling of meats
- Safe storage of meats
- Food Safety
- Sanitation
- HACCP basics
- Meat cutting
- Display case management
- Packaging
- Cooking recommendations for each cut of meat

Meat Retail Butcher Shop Owner Training- 1 week

- Business management
- Inventory Control
- Marketing
- Food safety
- HACCP basics
- Sanitation

Ministry of Agriculture Meat Inspector Training

The scope of work for this consultation requested a proposed training outline for Ministry of Agriculture meat inspectors. That request falls outside of the range of technical expertise of this consultant. This consultant did not meet with any government meat inspectors or any officials of the Ministry of Agriculture (MOA) to be able to determine training needs. In the USA meat inspectors are veterinarians provided by the US Department of Agriculture. These veterinarians undergo rigorous standard government training, testing and licensing program administered by the USDA. It is therefore recommended that USAID-*Inma* first conduct a needs assessment in collaboration with the MOA of Iraq to determine if meat inspector training is necessary and desired. Should the MOA desire assistance in this area, then an evaluation of the law on meat inspection for Iraq and the current training program for meat inspectors needs to be made with an eye to international standards before an improved training program can be developed. It is suggested that a USDA veterinary meat inspector trainer be contracted to conduct this evaluation and collaboration with the ministry. Once need has been established the USDA meat inspector could propose improvements to the MOA meat inspector training program, write the improved training outline and module and conduct a series of training of

trainers seminars with the MOA veterinary meat inspector trainers. This entire process from evaluation, through collaboration to training could take as long as 2 years.¹⁹

Technical Assistance Provided to Feedlot Owners and Red Meat Associations

The consultant brought two livestock harvest training DVD's from the USA, one video was about beef harvesting and the second was about lamb harvesting. Owners of five different feedlots viewed the videos and the consultant described the process of how to humanely kill and process beef and lamb. This session also presented a good opportunity to provide an overview of proper sanitation practices in slaughter and food processing facilities. The feedlot owners were surprised at the in-depth sanitation programs required in the U.S. and all agreed this is necessary for Iraq.

Meat cutting training was provided to feed lot owners, butchers and retail meat shop employees. (See training table below)

Meat cutting training included the following:

Beef

- Beef Primal Break Down: top round, sirloin tip, eye round, bottom round, top sirloin, loin, rib, chuck, arm, flat iron, shank, brisket, boneless Shank, mock tender
- Beef Steak Break Down: top round steak, top sirloin steak, sirloin tip steak, eye round steak, bottom round steak, New York strip steak, T-bone steak, rib steak, boneless rib steak, chuck steak, mock tender steak, flat iron steak, shank steak, skirt steak, flank steak
- ½ Beef Roast Break Down: top round roast, eye round roast, bottom round roast, chuck roast
- Making ground beef, kabobs and stew meat
- Trainees were provided with a beef cutting and cooking chart, "Beef Made Easy" See *Appendix D*

Lamb

- Lamb Primal Break Down: top round, bottom round, sirloin tip, top sirloin, loin, rib, shoulder, shank, brisket, leg of lamb
- Lamb Steak Break Down: leg of lamb steak, top round steak, bottom round steak, loin steak, rib steak, shoulder steak, sliced shank, sliced brisket
- Making ground lamb, stew meat and kabobs
- Trainees were provided with a lamb cutting and cooking chart, "American Lamb" See *Appendix E*

Sanitation and food safety training was a component of every training session. (See training table below)

Sanitation and Food Safety training included the following:

¹⁹ACDI/VOCA Farmer to Farmer Veterinary Meat Inspector Training- Mongolia, 1998-2003

- Checking for contamination on incoming product
- Proper and clean clothing for workers (shoes, aprons, hair coverings)
- Maintaining employee cleanliness throughout the day (clean restrooms, washing hands)
- Maintaining clean working surfaces
- Cleaning knives
- Proper temperatures for cooling, storing, working and freeing product
- Developing and maintaining cleaning schedules
- Clean packaging materials and meat display cases

Chicken Cutting Training included the following:

- Cutting the chicken carcass into: breast, drumsticks, highs, wings, back, necks
- Sanitation training for poultry handling
- How to remove feathers and pinfeathers
- Temperature controls for chicken meat
- Marketing training included
- How price the different cuts of chicken
- How to display chicken cuts on sales trays
- How to plastic wrap sales trays
- Importance of business planning when adding a new meat product you your business

After training at the Blann Butcher Shop a letter was prepared and sent to Mr. Mahmmmon A. Majeed, owner of the shop, outlining changes and improvements he needs to make concerning sanitation and at his shop. See *Appendix E*

Training for livestock harvesting, butchering, meat cutting and processing meat into sausages and toppings, cured, dried and smoked meat products requires that the trainees spend much time in “hands on” practice learning and lesson reinforcement. While books, manuals and course handouts are useful for orientation and for storing recipes, the actual how-to is best learned and reinforced by repetitive “hands on” experience under the careful monitoring of a skilled specialist. Skilled meat processors, like skilled chefs, need to be able to recognize when a sausage mix looks, feels and smells “right.” This “right” may have to be adjusted for each batch due to slight differences in meat tenderness, the quality of spices, the types of casings available or the humidity in the air.

The specialist in this activity provided hands on training for butchers of the Blann Butcher Shop in Dahuk, Al-Qosh feedlot and butcher shop and Bartillah feedlot and butcher shops. Other trainings included: Meat cutting and sanitation training for the Majidi Supermarket in Erbil and chicken cutting demonstration at the Taji Cold Storage Facility, Al-Mansour Compound and Baghdad. A complete table of training sessions follows:

Training Sessions				
Dates	Location	Training	# Trained	Trainees
Oct 30	Hawks of Iraq Feedlot	1 day- Beef- lamb slaughter video Beef- lamb training- sanitation and slaughter	10	3 owners 3 feedlot workers 4 Inma staff
Nov 1	Taji Feedlot	1 day- Beef- lamb slaughter video Beef- lamb training- sanitation and slaughter	19	1 owner 5 sons of owner 4 workers 5 Inma staff 4 guests
Nov 8	Dahuk Butcher Shop	1 day- Beef- lamb slaughter video Beef- lamb training- sanitation and slaughter	27	3 owners 2 managers 6 butchers 8 workers 2 Inma staff 4 guests 2 TV reporters
Nov 10	Al Qosh Feedlot	1 day-Beef- lamb slaughter video Beef- lamb training- sanitation and slaughter	20	6 association members 6 workers 2 MOA personnel 2 Inma staff 4 guests
Nov 11	Bartilla Feedlot	1 day- Beef- lamb slaughter video Beef- lamb training- sanitation and slaughter	19	2 owners 3 butchers 6 workers 6 business men 2 Inma staff
Dec 7-9	Dahuk Butcher Shop	3 days of training- Breaking down beef and lamb into primal cuts – cutting primal cuts into steaks	27	3 owners 2 managers 6 butchers 8 workers 8 business guests (restaurant and wholesale customers)
Dec 19-22	Dahuk Butcher Shop	4 days of training- Continued breaking down beef and lamb into primal cuts – cutting primal cuts into steaks Sanitation training Customer service training	21	3 owners 1 manager 4 butchers 8 workers 5 business guests (restaurant and wholesale customers)
Dec 29	Taji Cold Storage Facility Al-Mansour Compound Baghdad	1 day- Chicken meat cutting, sanitation, packaging, display, marketing, business planning,	18	1 owner 2 butchers 15 Inma staff
Jan 26-29	Majidi Supermarket Erbil	4 days of training- Sanitation breaking down beef and lamb into primal cuts – cutting primal cuts into steaks, Customer service, marketing	8	2 managers 3 butchers 3 workers
Feb 2	Al-Rafedain Chicken Slaughter House, Taji Qada, North Baghdad	1/2 day- Consulting- Chicken meat marketing, chicken processing facility renovation and expansion plans	1	1 owner
Totals		21.5 days Training	151 Trainees	

Technical Assistance Impact

Immediate Impacts

- Assisted, USAID-*Inma* sponsored Dahuk feedlot to increase meat sales. This consultant's meat cutting and marketing training resulted in two tons of beef and lamb being sold and shipped from Dahuk to the Majidi Supermarket in Erbil. Majidi Supermarket and Dahuk feedlot have met to discuss initial wholesale price for meat delivered to the supermarket. They are also trying to establish a level weekly market price for the meat. In addition they are discussing meat quality and sanitation requirements, which Dahuk must meet in order to be able to sell to the supermarket and payment timeframes.
- Dahuk feed lot quickly seized the information provided by the consultant and began to implement the proposed vertical integration strategy. Dahuk is now paying fees and using the government slaughter facility to slaughter livestock raised by the feedlot. The carcasses are then transported to Dahuk's small processing facility in the basement of the Dahuk owned Blaan Butcher shop. They have already established wholesale accounts with nine restaurants and two hotels. The Blaan Butcher shop opened for business in November 12, 2010. The small processing facility cuts up and sells 80 to 110 lamb carcasses per week and on average cuts up and wholesales about six beef carcasses per week. The Blaan Butcher shop sells retail cuts from an additional 14 lamb carcasses per week and an additional six beef carcasses per week.
- Dahuk is currently investigating whether to build a new meat processing facility based on the plans recommended in this document or to purchase an existing building and remodel it into a meat processing facility. Dahuk is currently planning to add the following value added products to their product mix: chicken, hamburger patties, meat balls, pizza, fresh sausage, smoked sausage, pastrami and jerky.
- Training in sanitation, meat cutting, meat-case display and customer service at the Majidi Supermarket in Erbil resulted in a doubling in the volume of meat sold in two days time. Lines formed as customers tried to place orders for new cuts of meat and USAID-*Inma* staff and the consultant at times had to serve customers as demand was so high.

Anticipated Impacts

- Worked with four feedlot owners, Hawks of IRAQ, Bartilla, Alqosh and Dahuk, to create vertical integration plans to build and operate small slaughter facilities, processing facilities and retail butcher shops. It is anticipated that one or more of these feed lots will be able to build at least a meat processing facility and a butcher shop and thus be able to increase income by capturing added value downstream in the value chain. With a reasonable payout period of five years for equipment investment:
 - \$3,560 for livestock harvesting facility equipment;
 - \$18,600 for meat processing equipment;
 - \$4,382 for retail butcher shop equipment,

It is anticipated that profits will be quickly realized.

- Created detailed list of equipment needed for livestock harvesting facility, meat processing facility, and butcher shops. Much of this equipment has never been used in Iraq and by introducing this new technology, better cuts of meat and varieties of ground meat products will be marketed to welcoming consumers as was demonstrated in Dahuk and Majidi Supermarket

- New high quality value added products such as fresh and smoked, bulk and link, beef and lamb sausages and other meat products such as jerky will begin to appear and be welcomed into the Iraqi market.
- Processing companies that produce value added sausages and smoked or dried meats will be able to make a profit and be sustainable.
- Each facility proposed in this document, once built and operating will increase employment.
- Those facilities which continue to follow sanitation guidelines presented by the consulate will produce much safer meat products for the market, ultimately resulting in a reduction of future food bore illnesses. This impact will be difficult to document as it is hard capture the number of people who do not become ill, but might have become ill under the previous lack of sanitation regime in the shops trained.
- Chicken cutting training will result in new poultry products reaching the market in Baghdad.
- Once these modern livestock value chain facilities demonstrate profitability and new meat products begin to reach the market, these facilities will be replicated by others wishing to vertically integrate or open a new business as a link in the value chain.

Recommendation for Future Technical Assistance

The general designs for a livestock harvesting facility, a meat processing facility, and retail butcher shop have been completed and provided to each of the five Inma feedlot owners. Each feedlot would like to build their own set of vertically integrated meat processing and marketing facilities, however, this is not likely to occur as only one or two of the feedlot owners have the capital required to build, equip and operate the full set of facilities.

Once one of the feedlot owners decides to proceed to invest in one or more of the designed facilities, a technical consultant will need to provide technical assistance and oversight during the construction, or possibly renovation, phase of the facility. This specialist will be able to assist the owner to:

- Locate and purchase proper building and finishing materials for a food processing facility;
- Construct the facility according to specifications that will assure food safety, employee safety, environmental protection, and ease in handling, moving, and storing product;
- Insure that all livestock holding pens and livestock moving alleyways and doors are properly constructed and operating properly;
- Insure that all water systems, cooling systems, waste disposal systems and carcass transport rails are installed and operating properly;
- Assist with technical aspects of company registrations and licensing for business.

Once the building of one or all of the facilities is constructed, or renovated, a technical consultant, skilled in livestock harvesting, meat cutting, meat processing and meat marketing will need to provide technical assistance and training to the management and staff of the facilities and butcher shops. This specialist will be able to assist the owner and staff to:

- Select and purchase equipment which will be appropriately sized for the anticipated volume of meat to be processed and meet international standards;
- Insure that all equipment is installed and operating correctly;
- Know how to safely and appropriately operate the equipment;

- Clean and maintain the equipment;
- Maintain a standard sanitation schedule for the entire facility;
- Understand all food safety requirements;
- Provide training on all topics listed in the training section of this document;
- Oversee the daily operation in collaboration with the owner/manager until it is clear that all staff and the owner/manager have fully absorbed the training and can use what they have learned consistently in every job required of them in the facility.
- Work closely with the facility owner/manager to develop a business plan based on costs and new potential selling prices of new products reaching the market;
- Provide advanced, follow up, and reinforcement training on meat cutting, marketing of retail cuts, and value added products;
- Sanitation will continue to be a major issue for each facility as employees turn over or become less vigilant in their cleaning routines thus continuous sanitation monitoring and reinforcement routines will need to be developed and instituted.
- In-depth training and follow up will be necessary to ensure all meat products being sold from the harvesting facilities, processing facilities and butcher shops are free of bacteria and of the highest quality.
- Butcher shop employees will need to be trained on the various meat cuts that are most tender and how to cook the different retail cuts.
- Customer service training and reinforcement will be key to the success of these new facilities and much time will need to be spent training sales staff and butchers who will serve customers.

I have worked with butcher shop employees at the Blann Butcher Shop in Duhok and at the Majidi Supermarket in Erbil on being able to market the more tender cuts of meat to their customers. Both facilities experienced extreme jumps in demand and both facilities doubled their sales of meat when new retail cuts were presented to their customers as options to the traditional big chunks of undefined meat. Offering customers more meat cut options increases profit for the butcher shop, assures that consumer have a good eating experience, which means those satisfied customers will return to purchase meat again and again.

Conclusion

Feed lots and livestock producers in Iraq currently have limited options for selling the animals they produce. They most often sell live animal to buyers for restaurants, hotels, supermarkets or small butcher shops. In some cases the feedlots contract the harvesting of the animals through the state controlled slaughter facility and then sell carcasses to the buyers. Smaller livestock producers may contract harvest their animals and sell carcasses, but more often they slaughter their animals using age old traditional methods. This report proposes that feedlots and livestock producers need additional options and opportunities to retain ownership of their livestock, carcasses and eventually the meat products and byproducts further downstream in the livestock value chain. Vertical integration would allow feedlots to capture additional profits at each link in the value chain.

USAID-*Inma* has supported the development of the Livestock Protein Value Chain through several integrated interventions. USAID-*Inma* had taught feed lot owners how to use technical, financial and market information to make beneficial and profitable business decisions, as well as how to identify and pursue profitable market opportunities. Grants were made for the construction of feed lots, feed lot owners received: technical assistance to design feed rations; business plan development assistance; critical input issues were addressed by demonstrating forage production and assisting veterinary testing and feed analysis laboratories. The USAID-*Inma* team continues to work to further strengthen the sustainability and competitiveness of the value chain.

The natural next step to develop the Livestock Protein Value Chain in Iraq is to pilot or demonstrate livestock harvesting, meat processing and meat retailing that produces sanitary, safe, high quality meat products, which will be welcome in the Iraq market and increase opportunities for profits for those companies willing to vertically integrate. For this to be successful the pilot company or companies must be willing to invest capital, purchase high quality equipment, train and support qualified employees, strive to meet international sanitation standards, create and offer new high quality products to satisfy customer demands. Therefore it is recommended that USAID-*Inma* provide assistance, technical support and training, to assist one or more of the feed lots to begin to vertically integrate.

Until the cost benefit and legality of building an owning a livestock harvesting facility can be thoroughly analyzed it is likely and recommended that feedlots continue to use the existing government controlled slaughter house, paying the standard slaughter fee while retaining ownership of the carcasses. When those issues have been resolved it is recommended that a demonstration or pilot livestock harvesting facility be built by a well capitalized feed lot.

While those issues are being resolved, plans and construction, or renovation, can proceed for a small pilot or demonstration meat processing facility. This would allow a feed lot to be able to sell their own meat products directly to hotels, large and small supermarkets, restaurants and small retail butcher shops. The beef and lamb carcasses would be taken from the state controlled slaughter facility directly to the small meat processing facility. Once at the processing facility the carcasses will be re-trimmed, washed and placed in a rapid chillier to quickly bring the temperature down to 32°F. Once chilled the carcasses will then be broken down into wholesale cuts, meeting customer specifications and sold to wholesale buyers.

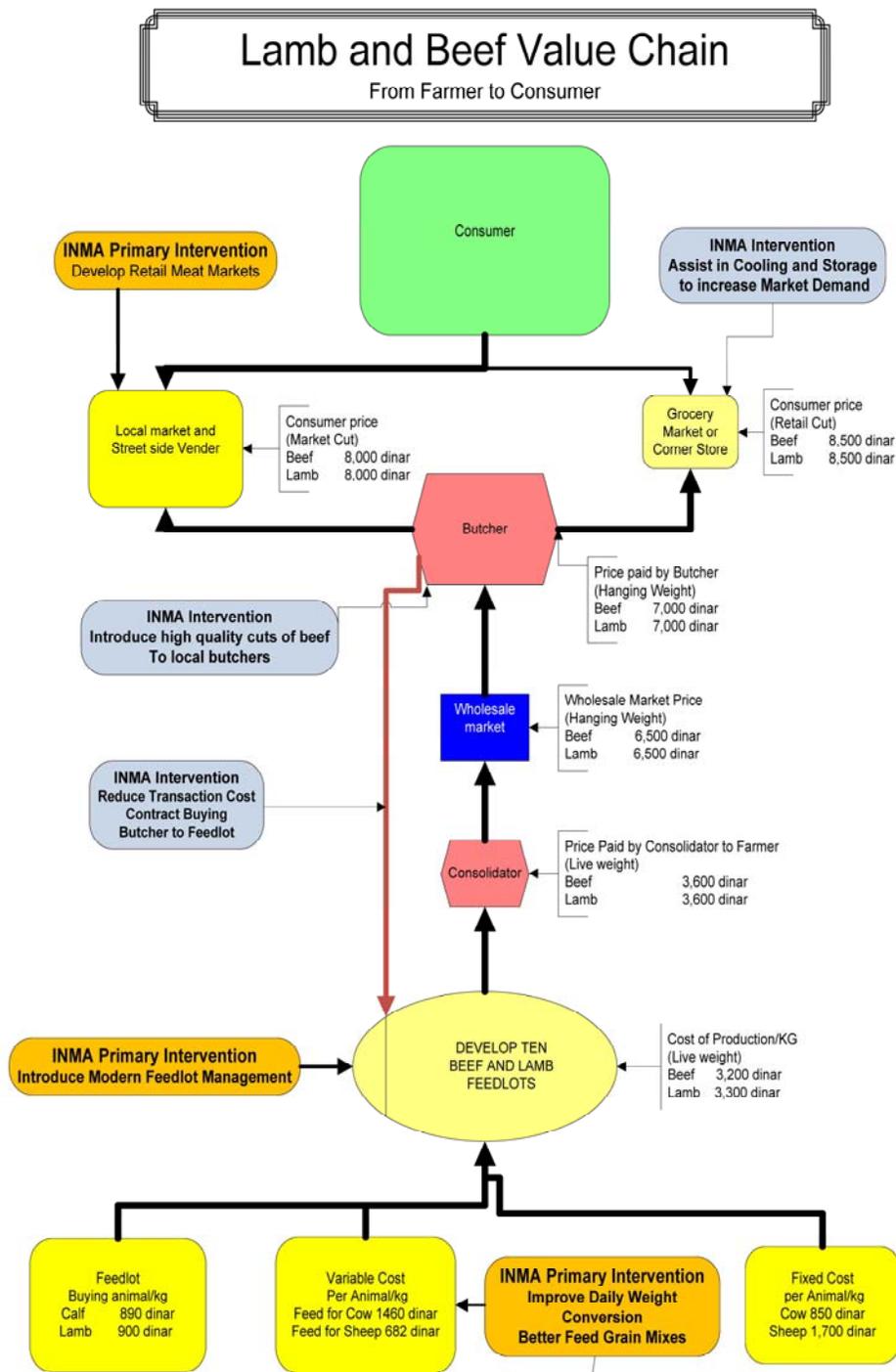
Additional profit could be obtained for the meat processing facility by purchasing a set of value adding equipment. Such equipment as a grinder, cuber, mixer, stuffer and smoke box could produce a variety of fresh and smoked and cooked sausages, jerky, hamburger patties, pizza toppings and meatballs, all of which will sell for higher prices than primal cut meats and have the advantage of turning fat trimmings and other byproducts into marketable products. Proper licensing will need to be obtained for these operations.

The final step for the feedlot owner to retain ownership of his meat product and to capture profits all along the meat value chain will be to open a retail butcher shop. The butcher shop will receive from the processing facility clean, sanitary, high quality carcasses that will be cut into specialty beef and lamb cuts for sale directly to consumers. The shop will be a retail outlet for the fresh and smoked and cooked sausages, jerky, hamburger patties, toppings and meatball products produced by the processing facility.

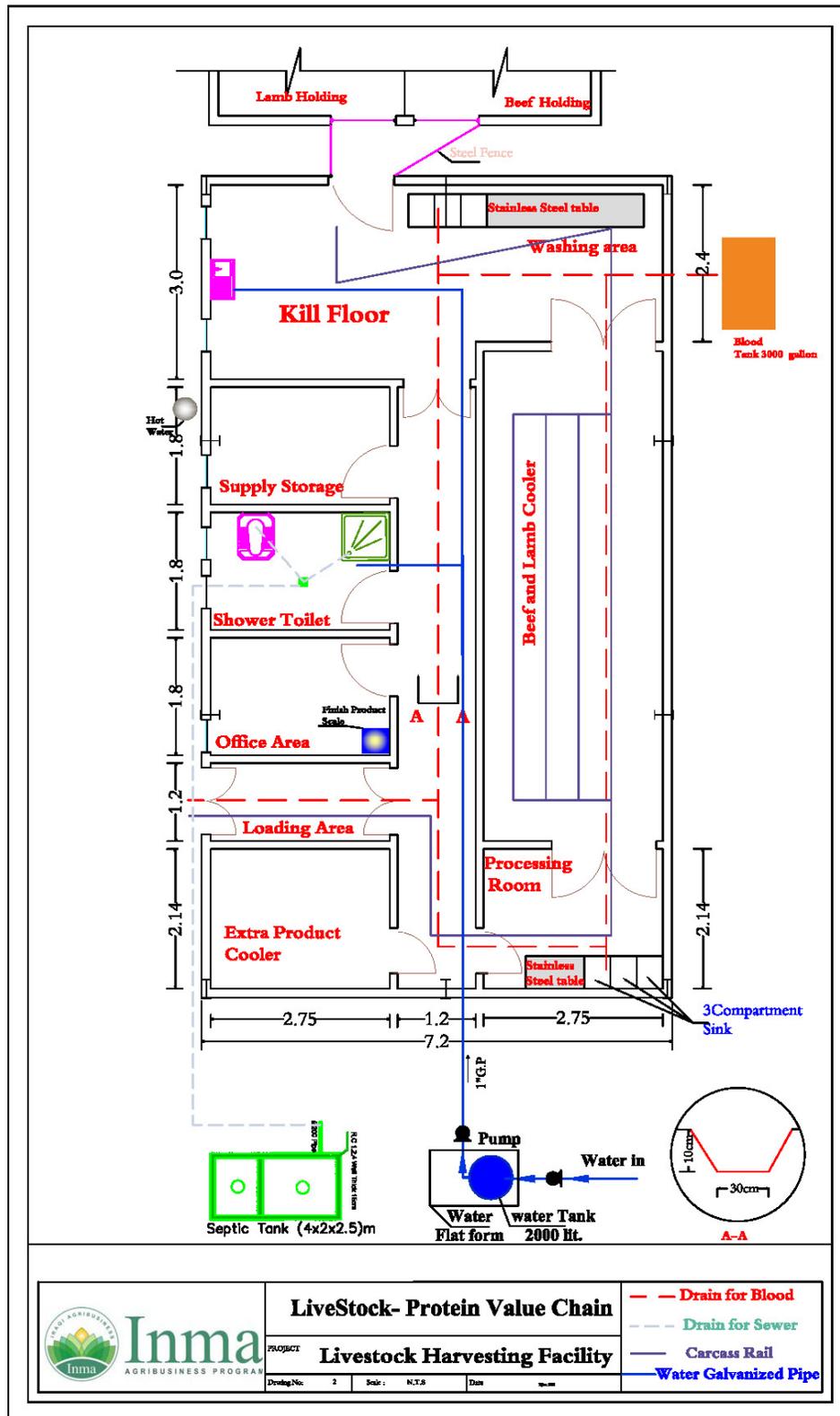
Several of the steps mentioned above in this conclusion are already being piloted by Dahuk feedlot. This feedlot is vertically integrating by opening their own butcher shop and by processing carcasses into both wholesale cuts for sale to hotels and restaurants and into retail cuts for sale through their Blann Butcher Shop. Dahuk has proved the value of differentiation of meat cuts in their butcher shop, doubling sales volume immediately after offering western style steaks chops and roasts for sale to their customers in December of 2011. Dahuk is currently seeking a site to build or locate an appropriate size building to renovate into a processing facility based on the plans provided in this report. Thus it is recommended that USAID-*Inma* provide full technical assistance, as outlined in this report, to Dahuk feedlot as they prepare to open a larger meat processing facility. Dahuk will be able to test market new products and serve as a demonstration and training site as additional livestock harvesting, meat processing and retail butcher shops wish to enter the Livestock Protein Value Chain.

I hope this report has been informative and will prove to be useful to feedlot owners or others considering building livestock harvesting facilities, meat processing facilities or retail butcher shops in Iraq.

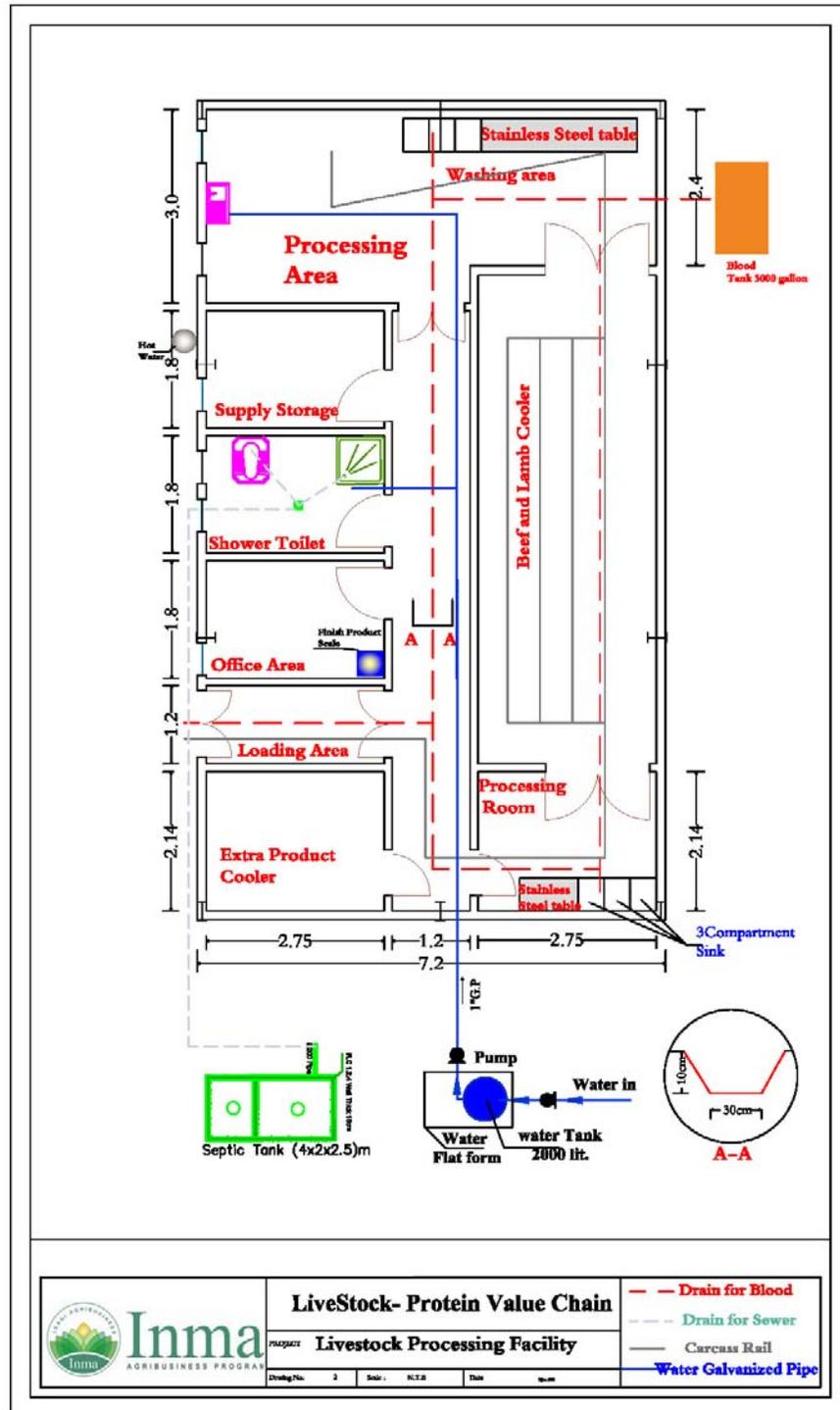
Appendix A: Lamb & Beef Value Chain



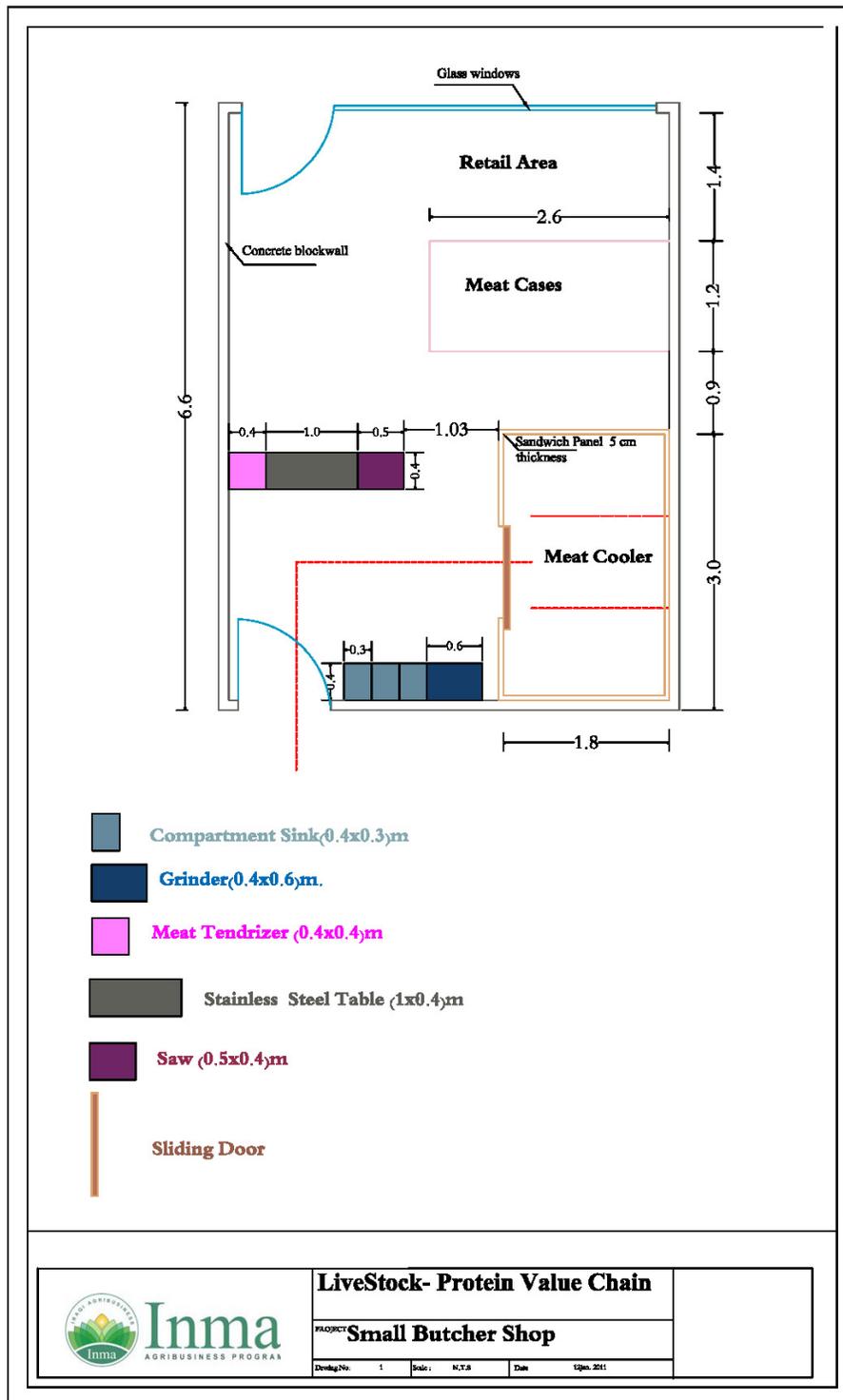
Appendix B: Livestock Harvesting Facility



Appendix C: Livestock Processing Facility



Appendix D: Small Butcher Shop



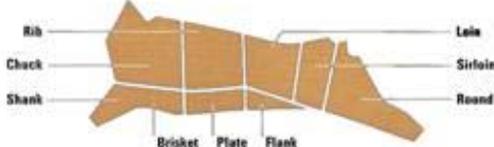
Appendix E: Beef Cuts



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FROM THE AMERICAN PEOPLE

Beef Made Easy

Retail Beef Cuts and Recommended Cooking Methods





Inma
AGRI-BUSINESS PROGRAM

Chuck



CHUCK 7-BONE POT ROAST



CHUCK POT ROAST Boneless



CHUCK STEAK Boneless



CHUCK EYE STEAK Boneless



SHOULDER TOP BLADE STEAK



SHOULDER TOP BLADE STEAK Flat Iron



SHOULDER POT ROAST Boneless



SHOULDER STEAK Boneless



SHOULDER CENTER Ranch Steak



SHOULDER PETITE TENDER



SHOULDER PETITE TENDER MEDALLIONS



BONELESS SHORT RIBS

Rib



RIB ROAST



RIB STEAK



RIBEYE ROAST Boneless



RIBEYE STEAK Boneless



BACK RIBS

Loin



PORTERHOUSE STEAK



T-BONE STEAK



TOP LOIN STEAK Bone-in



TOP LOIN STEAK Boneless



TENDERLOIN ROAST



TENDERLOIN STEAK

Sirloin



TRI-TIP ROAST



TRI-TIP STEAK



TOP SIRLOIN STEAK Boneless

Round



TOP ROUND STEAK



BOTTOM ROUND ROAST



BOTTOM ROUND STEAK Western Griller



EYE ROUND ROAST



EYE ROUND STEAK



ROUND TIP ROAST



ROUND TIP STEAK



SIRLOIN TIP CENTER ROAST



SIRLOIN TIP CENTER STEAK



SIRLOIN TIP SIDE STEAK

Shank and Brisket



SHANK CROSS CUT



BRISKET FLAT CUT

Plate and Flank



SKIRT STEAK



FLANK STEAK

Other



GROUND BEEF



CURED STEAK



BEEF FOR STEW



BEEF FOR KABOBS



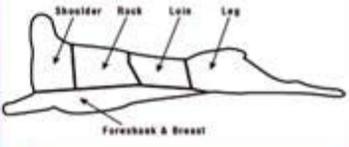
BEEF FOR STIR-FRY OR FAJITAS

Appendix F: Lamb Cuts



Lamb Cuts

Cuts & How To Cook Them



Leg

Whole Leg
(Roast)

Short Cut Leg, Sirloin Off
(Roast)

Shank Portion Roast
(Roast)

Center Leg Roast
(Roast)

Center Slice
(Broil, Grill, Panbroil, Pantry)

American-Style Roast
(Roast)

Frenched-Style Leg Roast
(Roast)

Boneless Leg Roast (BRT)
(Roast)

Frenched Hindshank
(Braise)

Sirloin Chop
(Braise, Broil, Grill, Panbroil, Pantry)

Boneless Sirloin Roast
(Roast)

Top Round
(Roast)

Rack

Crown Roast
(Roast)

Rib Roast
(Broil, Grill, Roast)

Rib Chop
(Broil, Grill, Panbroil, Pantry, Roast)

Frenched Rib Chop
(Broil, Grill, Panbroil, Pantry, Roast)

Loin

Loin Roast
(Roast)

Boneless Loin Strip (BRT)
(Roast)

Loin Chop
(Broil, Grill, Panbroil, Pantry)

Double Loin Chop
(Broil, Grill, Panbroil, Pantry)

Tenderloin
(Roast)

Shoulder

Square Cut Shoulder Whole
(Braise, Roast)

Saratoga Roast
(Braise, Roast)

Boneless Shoulder Roast (BRT)
(Braise, Roast)

Blade Chop
(Braise, Broil, Grill, Panbroil, Pantry)

Arm Chop
(Braise, Broil, Grill, Panbroil, Pantry)

Fore Shank & Breast

Fore Shank
(Braise)

Spareribs (Denver Ribs)
(Braise, Broil, Grill, Roast)

Riblets
(Braise, Broil, Grill)

Other Cuts

Lamb for Stew
(Braise)

Ground Lamb
(Broil, Grill, Panbroil)

Cubes for Kabobs
(Braise, Broil, Grill)

Appendix G:

Dear Mr. Mammon A Majeed

It was a great pleasure to be able to talk and work with you at Butchery. As per our talks on Dec. 19th to 21st here are the issues that need to be addressed before my next visit and also any PRT visits. As the resolution of these issues will be determined if the PRT will continue working with you and also could determine how Inma will continue to assist you. Please do not get upset at these issues. As we talked about this before and agreed that this is needed. If these issues can be resolved we will just have to retrain the workers to do the job correctly.

1. The inside of the butchers retail shops area, floors, walls, meat cases, glass windows on the meat cases should be cleaned hourly.
2. The inside and back of the meat cases should be clean at all times.
3. The sales area, offices, check-out area should be cleaned hourly.
4. The cutting tables and wrapping area needs to be washed with soap water and bleach every day.
5. Use plastic gloves when handling all meat.
6. Bathroom needs to have sit down toilet, take door off and put door where the step is when you walk in to the bathroom. Bathroom needs to be cleaned every 3 hours.
7. No meat should be left out of the cooler, if they are not working and cutting on it at the time.
8. Downstairs butchery should be kept at 10° C this will help to control bacterial problems and reduce the kg loss because the meat is too warm. You need an air conditioner unit to keep the area cooled. This issue will be one that the PRT will be looking at also.
9. The sink area needs to be kept clean all day long. You need to make sure the sink drains all the time. Install another sink next to the current sink to wash all tools, meat pans, cuber and grinder parts.
10. Do not allow employees to dispose of cigarette butts in the sink or on the floor.
11. Put shelves in the freezer area, in the cooler and also 5 shelves over by the sink area.
12. Remove all wooden pallets from the meat processing, coolers and sales areas and do not allow them to be in these areas at any time in the future. The bacteria build up from these pallets is really bad and is contaminating the entire product in the cooler.
13. Date label all products going into freezer. The label should include: date, what the product is, why it is old, and what you are going to make out of it next.
14. Have your sales staff and butcher clean upstairs and downstairs when not waiting on customers.
15. Check daily, all meat cases, coolers and the freezer to make sure the temperature in each is at the required level.
16. Dress code for all employees: butchers must wear clean uniforms, retail staff must wear clean uniforms, and no employee is allowed to wear sandals or open shoes.

On these issues I would be very happy to have talk with you to help and explain the need to resolve these issues or to share how we manage butcher shops like yours in the U.S.

Thank you

Ronnie Stratton