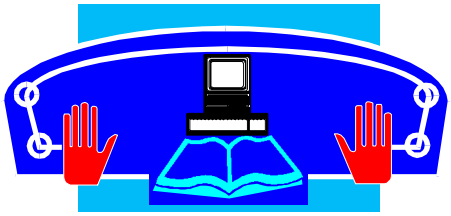

Hay River Abattoir Business Plan
Type of Study: Processing / Manufacturing
Date of Report: 1993
Author: Gnwt-ed&t
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EXECUTIVE SUMMARY

Purpose:

To provide infrastructure to the agricultural industry of the Northwest Territories by establishing a red meat abattoir that has the capability of slaughtering and processing domestic livestock.

Background & History:

The present livestock sector of the agricultural industry in the Northwest Territories is limited not so much in its ability to produce but in the lack of required infrastructure to allow for processing of product and thus access to domestic markets. The Department of Economic Development & Tourism with financial assistance through the Economic Development Agreement (EDA) would like to develop infrastructure to encourage livestock production in the Northwest Territories and at the same time Create a successful meat processing industry.

Considerable efforts have been made by the Department of Economic Development and Tourism to ensure the public and other Governmental Agencies and Departments have had opportunities to participate in the development of this project. Valuable information and insight were gained through this consultation phase.

After several attempts, a design for a Territorial abattoir which suits the needs of the NWT was completed. This proposed facility is modular (portable) and was designedly ATCO. The estimated cost of the facility is close to the allocated EDA budget of $1,310,000. This abattoir will have the capability to slaughter and process hogs, beef and sheep.

Protect Description:

The abattoir will be located on a fifteen acre site, seven miles south of the Town of Hay River. The facility will be one floor of approximately 4,340 square feet with an attached barn of 1,280 square feet, two attached trailers of 640 square feet for storage of inedibles and dry goods and a separate hide facility of 480 square feet. Total size of the facility is approximately 6,740 square feet.

Equipment will be purchased to give the abattoir the capability to slaughter and process products.

Operations:

As there are very few cattle in the Northwest Territories it was decided that production of the plant would initially be based

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solely on the slaughter and processing of hogs. It has been projected that the abattoir in Year 1, will slaughter and process 35 hogs per week as this is the current production in the Northwest Territories. It is anticipated that by Year 3, production will increase to 105 hogs per week.

The capacity of the abattoir is 30 hogs per day. This figure is dependent on the abattoir selling products of 30 hogs on a daily basis. If inventory accumulates, the capacity of the plant will decrease as space in the storage cooler is limited.

Initially, the volume of meat produced in the plant will be 4,518 pounds per week or 235,000 pounds per year. By Year 3, the output will increase to approximately 707,000 pounds per year. Products that will be sold include fresh cuts (ribs, loins, etc.) and processed products (sausages, jerkies, hams and bacon).

There is also potential in custom processing wild game for local hunters however, this activity will not be aggressively pursued as the main goal of the plant is to slaughter and process domestic livestock.

Supply:

In the NWT, commercial livestock production is limited to one farrow to finish operation. This operation produces approximately 35 market hogs per week. However, interest has been put forth by individuals to establish additional livestock operations including a feedlot if proper infrastructure was in place.

If additional livestock is needed, the abattoir has been assured that livestock producers in Northern Alberta will supply up to 200 market hogs every week.

Market:

The potential market area for the abattoir is the North and South Slave Regions. The total population of this area is 23,527 which represents 42.80% of the population in the Northwest Territories.

From a study ccmpleted by Peat MarWick Stevenson & Kellogg on the consumption of red meats in the Northwest Territories, it was determined that the annual consumption of pork is 63.0 pounds per capita. From these results, it was determined that in the North and South Slave Regions the weekly consumption of pork is 28,500 lbs or 180 hogs.

In the first year of operation, the facility will slaughter and process 35 hogs per week. This represents approximately 21% of the consumption demand in the North and South Slave Regions. This level of market penetration should easily be attainable as the price of the product will be competitive and the quality will be of a high standard. Also, there are letters of support for the

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abattoir from retailers and distributors in the NWT.

To determine what type of pork products are consumed, a survey was completed in July 1992 by the Department of Economic Development and Tourism. The results of the survey indicate that 40% of the animal is consumed as fresh cuts (loins, ribs etc.) and the remaining 60% of the animal must be further processed into cooked, cured and smoked products (sausages, hams, bacon, blood pudding, etc.) . The survey also determined wholesale prices for both fresh and processed products. The average price for fresh cuts is $1.23 per pound and the average price for processed product is $2.06 per pound. Based on this information, the average return per hog is $219.38.

Capital Requirement:

Capital items required for this project are as follows:

Site Preparation	$ 125,000.00
Additional facilities	$ 135,000.00
Equipment	$ 280,000.00
Vehicles	$ 60,000.00
Main Building	$ 516,000.00
Capital Costs	$1,116,000.00

Capital costs were based on firm written and verbal estimates from southern and northern companies.

Through the tendering process the capital costs estimated for this project may change as the Northern Preference Policy may increase these capital costs as much as 15%. Under the Northern Preference Policy, a northern contractor may be awarded a contract if their bid is within 15% of a southern contractor. Therefore, capital costs for this project may be underestimated by 15% or $167,000.

Financial Plan:

Capital costs for this project have been estimated at $1,116,000. Other costs include the salary for the facilitator or the general manager, study costs, administration and working capital.

Application of Funds:		Source of Funds:	
Capital Costs	$ 1,116,000	EDA	$ 1,310,000
Facilitator	240,000	Shortfall	288,000
Study	136,000		
Administration	36,000		
Working Capital	70,000		
Total	$ 1,598,000	Total	$ 1,598,000

The budget set for this project is $1,310,000. As can be seen from the above, there is a shortfall of $288,000. This amount of funding has yet to be identified however, EDA will be approached for additional funding.

The costs associated with this project, $1,598,000, cannot be decreased without seriously jeopardizing the projects viability.

Financial Projections:

Profit and loss statements and cash flows were projected for a three year period. TWO scenarios are presented. In Scenario A, the worst case scenario, prices are conservatively estimated and no revenues from custom killing or pet food are projected. Scenario B, the best case scenario, prices are increased by 10% and revenues are projected from pet food and custom killing. Expenses varied accordingly.

Scenario A: Worst case scenario.

	YEAR 1	YEAR 2	YEAR 3
Sales	399,620	799,640	1,199,460
Cost of sales	328,560	652,120	975,680
Gross Margin	71,260	147,520	223,780
Expenses	168,000	190,985	209,800
Net Income	(96,740)	(43,465)	13,980
Net cash surplus (deficit)	13,155	3,280	(15,725)

Scenario B: Best case scenario.

	YEAR 1	YEAR 2	YEAR 3
Sales	475,700	944,720	1,413,800
Cost of sales	352,400	699,795	1,047,285
Gross Margin	123,300	244,925	366,515
Expenses	168,000	189,500	208,000
Net Income	(44,700)	55,425	258,515
Net cash surplus (deficit)	61,850	85,065	89,075

Under Scenario A, the abattoir will break even by the third year of operation. Scenario B is more favorable as net income for the third year is projected at $158,515.

Management & Ownership:

It is envisioned that the Government of the Northwest Territories will own all physical assets and a private operating company will operate and maintain the plant. A lease, stipulating conditions etc., will be drawn up between the Government of the Northwest Territories and this operating company.

The Department of Economic Development and Tourism has received a letter from the Hay River Metis Development Corporation indicating their desire to operate the facility. However, to date, there has been no negotiations with any companies or individuals including the Hay River Metis Development Corporation with respect to the operations of the abattoir.

Licensing & Inspection:

Prior to construction, blue prints will be approved by the respective GNWT Departments in Yellowknife and Hay River to insure that all building, fire and health codes have been met. Approved permits will be issued prior to the construction of this plant.

A development permit for the site has been approved. Agencies involved in the approval of this permit were the Town of Hay River, the Department of Municipal and Community Affairs and the Commissioners Land Review Committee. However, prior to construction of the abattoir approval must be granted by the Federal Environmental Review Panel. An application will soon be presented to this panel and a decision is expected by the end of March 1993.

Currently, there are no regulations in the Northwest Territories with respect to the inspection of livestock slaughtering and processing. The Department of Renewable Resources is currently developing a Territorial Meat Hygiene Act. With this act in place the abattoir could then produce inspected products for consumers in the Northwest Territories. This Meat Hygiene Act is crucial to the success of this plant.

Environmental Concerns:

All aspects have been considered in the design of this facility to limit any impacts on the environmental.

Economic Benefits:

Several economic benefits will be derived from this project and they are as follows:

1) Direct employment will be created at the plant. Initially, three full time positions will recreated. By year three, it is expected that eight full time positions will have been created.

2) With the abattoir operational, several indirect jobs will be created. It has been estimated that by year three, nine positions in livestock production and transportation will have been generated. Four of these positions will be created in livestock husbandry as it is expected that hog production will triple. Also, with the creation of additional livestock operations feed requirements will increase which will create two additional positions at the feed mill.

   An additional three positions is expected to be created in the transportation of feed, livestock and finished product.

3) Livestock production facilities will increase which will enhance the viability of the whole agricultural industry.

4) There will be significant spin offs locally through the payment of taxes and the purchasing of local supplies such as propane, gasoline, electricity and equipment.

5) The abattoir will replace southern imported product. Import replacement is a GNWT objective.

Summary:

The purpose of this project is to provide infrastructure to the agricultural industry of the Northwest Territories by establishing a red meat abattoir that has the capability of slaughtering and processing domestic livestock. The abattoir that has been designed has this capability. It has also been shown that there is a supply of raw material, a market for products and a good chance of financial success. Therefore, the project should be supported.

BACKGROUND & HISTORY

The present livestock sector of the agricultural industry in the Northwest Territories is limited not so much in its ability to produce but in the lack of required infrastructure to allow for processing of product and thus access to domestic markets. A catch 22 exists in that without sufficient primary production, infrastructure cannot be placed, however, without infrastructure, primary production cannot attain sufficient levels. The Department of Economic Development & Tourism with financial assistance through the Economic Development Agreement would like to develop infrastructure to encourage livestock production in the Northwest Territories and at the same time create a successful meat processing industry.

The first phase in the development of this project was to inform and consult with the public. Since September 1991, considerable efforts have been made by the Department of Economic Development and Tourism to ensure the public and other Governmental Agencies and Departments had opportunities to voice concerns or opinions with respect to this project.

A public meeting was held late in 1991, to discuss concerns with the establishment of an abattoir and to select an individual to represent public participation in the EDA Management Sub Committee. At the meeting were representatives from the Territorial Farmers Association, Town of Hay River and the farming community. The meeting was very productive as all concerns with respect to the proposed project were tabled and dealt with. Also, at this meeting, Tom King was selected to represent the public on the EDA Management Sub Committee.

Tom King as the public representative, informed and consulted the public by holding numerous meetings and information sessions in conjunction with media advertising. Also, officers with the Department of Economic Development and Tourism continued to consult on this project with several Governmental Departments and Agencies including the Department of Renewable Resources, Department of Health, Municipal and Community Affairs, Commissionerts Land Review, Water Board, DIAND and Agriculture Canada.

Valuable information and insight were gained through the consultation phase which put the Department of Economic Development and Tourism in a position to properly utilize the $50,000 received under theEDA for the fiscal year 1991/92. The funding was usedto contract Peat MarWick Stevenson and Kellogg to start on design work for the abattoir and to hire a facilitator to coordinate and develop the project.

Peter Gall, who has over 30 years experience in the meat industry,

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was hired as the facilitator. He has been involved in all facets of the industry including slaughter, processing, marketing, training, distribution and management. With this experience, the development of this project will move in a positive direction.

On May 7, 1992, the EDA Management Committee approved the operational budget for the fiscal year 1992/93 in the amount of $191, 000• The operational budget included salary dollars for the facilitator and funds to complete the design work on the abattoir.

Peat Marwick Stevenson and Kellogg completed a design and cost on a Federal red meat abattoir. The cost of a Federal facility was estimated at $2,500,000 to $3,000,000 which is significantly over the allocated budget for this project. Therefore, from the information provided by this firm, it was decided that a Territorial plant would instead be designed and constructed.

After several attempts, a Territorial facility was eventually designed which suits the needs of the Northwest Territories. This facility is modular (portable) and was designed by ATCO. The estimated cost of the facility is close to the allocated budget for this project. The abattoir as designed will have the capability to kill and process domestic livestock including hogs and cattle.

The abattoir, as outlined in this business plan, has a good chance of financial success. The development of an abattoir would be beneficial to both the agricultural and business sectors in the Northwest Territories.

PROJECT DESCRIPTION

The objective of this project is to construct a slaughter and processing facility that has the capability of handling several types of livestock including hogs, cattle and sheep. The facility would be constructed to Territorial specifications and would market it's product in the Northwest Territories-

A description of each component of this project including location, design, buildings and equipment are listed below.

Location:

The Town of Hay River has allocated a 600 acre parcel of land to an Industrial Park located 7 miles south of the Town on Highway #2. This area is known as the Triangle as the Industrial Park is formed by two highways, #2 and #5, and intersected by the CN rail line that formerly serviced Pine Point.

A 15 acre site at the southwest corner of this Triangle, has been set aside for the development of the abattoir. A map of this Industrial Park showing the abattoir site is enclosed in Appendix A.

The CN Railway will shortly be removing tracks, ties and gravel from the rail line that passes through the Triangle with the exception of one quarter mile east of Highway #2, which will only have the tracks and ties removed, thus forming a road bed for access into the abattoir site.

The results of the geophysical work completed on the original site indicated there were no serious soil problems however, a closer in depth study of the area proved that the plant should be located east of this original site. The ground is higher and appears to have better drainage. New geophysical will be required prior to finalization cf blueprints.

Design:

The original design proposed by Peat Marwick Stevenson and Kellogg was estimated at a cost of $2,500,000 to $3,000,000 which is considerably higher than the budget set for this project. Since this design was proposed, the Facilitator along with several other companies in Southern Canada set out to design an abattoir that would come in on budget. After several designs were completed it was decided that a Federal facility constructed in the Northwest Territories was impractical as the costs were too high.

The costs to construct an abattoir in the Northwest Territories is significantly higher than constructing such a facility in Southern Canada. For example, plants located close to Edmonton can ship on a daily basis inedibles to Northern Alberta processors for rendering and hides to Dominion Tanners. The Hay River facility is 12 hours away from Edmonton, which makes it impractical to utilize these services on a daily basis. Therefore, inedible and hide storage facilities have to be constructed which increases the costs of the overall facility.

Several companies provided designs of a Territorial facility. It was decided that the preliminary design submitted by ATCO was the most suited to the needs of the Northwest Territories. The design consists of six modules, one module 14ft. x 40ft. and five modules 14ft. x 54ft.. Also, there are two fold away metal buildings, 32ft. x 24ft., which will be used as the barn and 20ft. x 24ft. which will be used for hide storage. The complex will also have two attached 8ft. x 40ft. trailers. One will store packaging supplies and the other will act as a holding freezer for inedible products. The inedible trailer will be attached to the kill floor section of the main building.

The preliminary design presented by ATCO is modular which means it is somewhat portable. The abattoir along with the additional facilities will be built to Territorial Specifications. See Appendix B for the preliminary design of the facility.

If the abattoir is approved in principle, a set of working drawings can then be completed for this modular facility. ATCO engineers can complete this task at a cost of $10,000.

Buildings:

The facility will be one floor of approximately 4,340 square feet with an attached barn of 1,280 square feet, two attached trailers of 640 square feet and a separate hide facility of 480 square feet.

A detailed description of all the required buildings are as follows:

1) Hide Building:

The hide building will be located on the abattoir site. This facility will be fully equipped to handle and store hides. The building will be refrigerated and holding tanks will be installed to allow for a complete and thorough wash down when the building has been emptied of hides. Also, the building will have power.

Initially, the hide building may not be fully utilized as the majority of animals slaughtered and processed by the abattoir

will be hogs. However, if the abattoir is to have the capability of slaughtering cattle a hide storage building is required.

The hide storage building could be utilized by other businesses to store moose or caribou hides. This will greatly benefit the arts and crafts and tourism sectors.

2) **Abattoir:**

Barn: The barn will be constructed of interlocking metal covered panels on a cement floor. The pens in the barn will be built in a modular fashion so they can be utilized to handle as many animals as possible from different producers. Each pen will have running water and a sewer. Space has been provided for a one horse type scale to weigh live animals. All pens and alleys will be accessible by bob cat so that the manure can be removed. The manure will be loaded onto a truck and taken from the main plant to the comporting site. The receiving doors for live animals will be elevated at different levels to allow for fifth wheel trailers and cattle railers.

There will be an alley between the barn and kill floor which will allow a person to move the selected livestock to the knocking box with minimum bruising or trauma to the animal.

Kill Floor: The kill floor has been designed to accept cattle, calves, sheep and hogs.

The handling of animals, rounding up, moving to the knocking box, stunning, sticking, bleeding and hanging on the rail is the same Procedure for cattle, calves, sheep and hogs. For evisceration, cattle, calves and sheep would be processed on a different line than hogs.

A common rail system will be used for all dressed animals when trimming, inspecting, washing and scaling.

In order to eliminate BOD's from waste water, the animal paunches and intestines will be moved to the inedible room where all manure will be removed and taken to the comporting site. Remaining product may possibly be produced into animal food or shipped to a rendering facility in Edmonton.

The hides will be removed from the kill floor on a daily basis to the hide building where they will be salted and stored until shipped to a tanning company in Edmonton, Alberta.

Blood form the animals will be stored in a stainless steel tank below the bleeding area on the kill floor. Atthe endof each day, this blood will be packed into containers and stored in the inedible trailer. The blood along with the other

inedible will be transported to a rendering facility in Edmonton, Alberta.

Chill, Holding Cooler: This cooler is capable of holding 12 to 15 cattle or 24 to 30 hogs. When the dressed animals enter this cooler, their internal temperature is around 80 degrees Fahrenheit and must be reduced overnight to below 40 degrees fahrenheit. The shrinkage (moisture loss) to dressed animals in this room is from 1.5% to 2% of carcass weight. Dressed hogs cannot be stored in this cooler at the same time as beef type animals. If hogs and beef were to be slaughtered on the same day an additional chill cooler would be required.

Dressed carcasses kept for any length of tine in this cooler will lose another 1% to 1.5% in shrinkage.

Fresh Meat Processing: There will be three major lines setup and they are as follows:

a) Breaking dressed animals, fabricating, vacuum packing and boxing. Portioning and counter ready meats will also be prepared on this line.
b) Grinding and producing bulk ground meats and patties.
c) Grinding and stuffing sausages.

Sausage Kitchen: The grinding and stuffing line will be utilised by the sausage kitchen as well. The sausage kitchen will house a smokehouse that can operate 24 hours per day and a small walk in cooler to chill the cooked products prior to shipping.

Shipping Area: All products will be order assembled and shipped from this area. Dock level is 54 inches from the roadbed to accommodate refrigerated trailers. A trailer will be attached to the shipping area to store packaging and spices.

Main Office: Will accommodate two clerical staff.

Washrooms and Change Rooms: Recommended requirements is one toilet for one to nine employees and two toilets for 10 to 19 employees. The facility will have a mens and ladies washroom with two toilets in each room.

A separate locker will be provided for each employee plus area to hang up their street garments and street shoes. The change rooms will be adjacent to the respective washrooms.

Lunch Room: The lunch room will have sufficient seating for a maximum of 12 people. It will be equipped with refrigerator, stove, double sink and cupboards.

Laundry: The laundry will house a heavy duty washer and dryer

as employees will be issued "whites", coveralls and smocks that must be washed everyday. Employees working on the kill floor may have to change more than once per day. Also, shrouds will have to be washed and dried prior to use.

Mechanical Room: Located off the kill floor, this room will house refrigeration and air compressors, hot water tanks and the furnace.

Equipment:

The following is a breakdown of equipment needed for the successful operation of this abattoir. Each section will describe some of the equipment needed for that operating area. For a complete listing of the equipment please see Appendix C.

1) Kill Floor Equipment:

There are many pieces of equipment required in handling and slaughtering livestock. Some of the equipment needed on a kill floor includes stunners, rails, saws, shackles, tables, scalding tank, gambrel basket, scales, tub trucks, wash stations, and air compressors.

2) Fresh Meat Equipment:

Equipment is needed to cut meat into saleable portions and to package. The main equipment needed for this area is a portioning saw, vacuum packer, meat tenderiser, box strapper and a scale.

3) Grinding Equipment:

Basically, in order to grind meat and make patties the equipment required are grinders and patty machines.

4) Sausage Line:

In order to prepare sausages, a sausage stuffer and a sausage linker are required.

5) Curing Line:

To cure meats a brine pump and a pickle injector will be required.

6) Smokehouse:

A smokehouse will be required along with smokehouse trucks, bacon hook stand and a stainless steel cooking vat.

7) **Slicing & Packaging Equipment:**

To properly slice and package all products produced at the plant a slicer and vacuum pack machine are required.

8) **Refrigeration:**

The modules purchased from ATCO will have built in coolers and freezers which utilize the freon 22 system. Proper sizing of the refrigeration will be completed with the working drawings.

9) **Water & Sewer:**

Abattoirs in Southern Canada usually have access to piped water and sewer. This facility, at least initially, will not have access to piped water or sewer as the Town of Hay River is unable to provide this service at this time. Therefore, a separate building will be constructed with the capacity to hold two 5,000 gallon tanks, one for water and the other for sewer.

This proposed building will be a shell built on a concrete foundation. It will house not only the storage tanks but, pumps for both water supply and the waste water systems. Heat and power will be supplied by the main building.

Fresh water will be supplied by 2,500 gallon tanker trucks and waste water will be removed by an 1,800 gallon tanker truck. All waste water will be dumped in a cell at the Town of Hay River's sewage lagoon. The project is providing the Town of Hay River $50,000 to build a new cell that will be capable of handling the waste from this plant.

10) **Vehicles:**

Several vehicles will be required including a refrigerated truck/van to make local deliveries, a grain box with dump to handle the manure and hides and a bobcat to remove the manure from the barn.

OPERATIONS

Plant Process:

Abattoirs are designed and built to bring in live animals at one end and ship out finished product at the other end. This abattoir is designed to slaughter and process cattle, hogs and sheep.

A foreman and an assistant will form the basis of the work and teaching force. Additional staff will be hired as required. It will take a minimum of three people on the kill floor to be able to process any quantity of animals. Most kill/ship plants of this size with a maximum kill, operate with 5 to 6 people on the killing floor and one cleanup person.

Generally, the plant will kill in the afternoon and scale, break, fabricate, pack, process, order assemble and ship in the morning. Livestock will be received the day they are to be slaughtered. Scheduling of animals to be slaughtered will be the responsibility of the abattoir.

The barn has a holding capacity for two days kill. All animals will be weighed and weights recorded. After scaling, animals will be placed in holding pens that are clean and covered with bedding. Water and feed will be available to animals in the holding pens.

The drover/knocker will place animals in the knocking box and by using a stun gun will render the animal unconscious. Stunned animals will be rolled out of the knocking box and hoisted to the bleeding rail, where the jugular will be stuck by a knife and the animal bled. The whole blood will drain into a holding tank that is located under the bleeding area. The tank is pumped out at the end of each day and cleaned. The whole blood is removed with the inedible and hides on a daily basis to off site facilities.

Hogs and cattle are dressed on separate systems and after evisceration, utilize the same trim and inspection rail, prior to being scaled\ tagged and moved into the chill cooler.

Bled pigs are lowered into a scalding tank for approximately 4 minutes to soften bristles. After scalding, pigs are moved by electrical hoist to the beater where the majority of the bristles are removed. After beating, the animal is rolled out of the horizontal beater and onto a grambeling table. At this point, the gambrel or hook is placed into each hind leg of the pig and hoisted to the dressing rail.

To insure that all bristles are removed, in particular from the head area, a torch along with manual scraping are employed.

The pig is then opened, viscera removed to the inspection cart, caul fat removed and breast bone along with the carcass are split. After the viscera is inspected by a Veterinarian, liver, heart and kidneys are placed on offal truck, while the inedible viscera is disposed of through a stainless steel chute into the inedible room. After each use, the viscera truck must be thoroughly washed.

Cattle are handled in the same manner as pigs up to and including the actual bleeding. Prior to leaving the bleeding area, the head is skinned, removed and placed onto an inspection station. The front legs are skinned open and the front feet removed. At this point, the animal is lowered to the dressing rail by a person working the high bench.

On the high bench, the person will skin the hind legs, remove the hind feet, make a hole in the tendon on each leg and insert a beef roller hook, placing the roller end on the dressing rail. These beef rollers and hooks are of a standard weight, 7 pounds each. The person will place each roller on the dressing rail prior to skinning both rumps of the animal.

The animal is then moved to the low bench, where the front quarters are skinned open. The animals hide will then be removed by a hide puller. After removal, the hide is manually moved from the kill floor to the hide room by a stainless steel chute.

After leaving the low bench, the animal is opened and the caul fat, viscera, kidney suet fat and kidneys are removed and placed on the inspection truck. After inspection, livers, hearts and kidneys are placed on the offal truck and the inedible viscera is removed to the inedible room. After the inspection truck is washed, the breast bone and carcass are split. A scribing tool is used to score the spinal column on the front quarter and then the scribed bones are hit with the flat side of the scribing tool to give the rib portion of the animal a more round appearance. The sides are then washed manually by a high pressure spray hose to remove excess blood.

If the animal is of quality grade, shrouding maybe required. This is done by covering the meat side of the animal with a clean wet sheet. After the animals have been shrouded, the carcass is inspected , weighed and then placed into the chill cooler. When the shroud is removed the next day, the fat finish will be smooth.

Once the beef heads are inspected, the tongue, head and cheek meat are removed and placed on the offal truck along with the skinned and cleaned tail. Sweet breads or Lymph Glands are removed from the heart area and placed on the offal truck. At the end of each day's kill, the offal truck is placed into the chill room for cooling.

The following day when dressed beef carcasses have been cooled

sufficiently, internal temperature of 40 degrees Fahrenheit, they can be shipped in sides, quarters, or primal cuts. The above items can also pass through the boning table, where the primal cuts are fabricated into sub primal cuts, vacuum packed and boxed. For food service accounts, some of the sub primal can be portion controlled, vacuum packed, boxed and shipped fresh or frozen.

As for pork, all products that are not sold fresh will be cured, cooked *or* smoked for further resale to retail or food service accounts. Products will be trimmed, ground and then formulated into an emulsion that will be either produced into link or coil sausages, which can be shipped fresh, frozen, smoked or cooked.

Trimmed pork cuts will be cured with a hand injector, placed under a cover cure for one to three days then hung on smokehouse trees and smoked. After smoking, smokehouse trees will be moved to a chill cooler to bring internal temperature down from 100 degrees fahrenheit to 70 degrees Fahrenheit. The product will then be placed into another chill cooler to reduce internal temperatures to 40 degrees Fahrenheit at which time the product can be packaged for shipping. Packaged product will be moved to a holding cooler.

All smokehouse trees and equipment must be washed after use. sausage kitchen equipment will be washed and disinfected at the end of each production day.

All product will be packaged properly and will be order assembled in the shipping area. The shipping area has two large doors to receive trucks.

The plant will be cleaned thoroughly after each shift. All equipment, floors and walls will be cleaned using a high pressure low temperature (150 degrees) foam system.

Glass board will be put on all walls and ceilings and floors will be built out of aluminum checker plate. These materials are easily kept clean and are currently used in Federal plants.

Production:

As there are *very* few beef animals in the Northwest Territories it was decided that production of the plant would initially be based on the slaughter and processing of hogs. The plant would still have the capability to slaughter and process beef when these animals became available.

1) **Capacity:**

The plant capacity is dependent on physical size as well as equipment and working stations.

Kill Floor: The hog scalding tank is of minimum size. The dressing rail length is 24 feet which will accommodate seven employees. Plant dressing rail will accommodate five working stations. As designed, maximum capacity of the kill floor on a regular 8 hour shift is 6hogsper houror 36 hogs per day. At least 2 hours per shift must be dedicated for cleanup.

Holding Coolers: The chill holding cooler has four rails, each 10 feet long of which three rails could be used for hogs or cattle and the fourth rail is left empty to accommodate offal. Hogs require one foot of rail space while cattle require two feet. Daily holding capacity, provided that all meat from previous day's kill has been processed, is 30 hogs or 15 cattle.

processing Area: The breaking and boning area has the capacity to process 36 hogs per day. The sausage kitchen is restricted by the smokehouse and cook tank capacity. The single cage smokehouse and cook tank can produce the required products from 30 hogs per day.

Storage Coolers: Storage coolers have the capacity to store approximately 35 hogs.

In summary, the facility as designed, has the capacity to slaughter and process approximately 30 hogs per day. This figure is dependent on selling products of 30 hogs on a daily basis. If inventory accumulates, the capacity of the plant will decrease as space in the storage cooler is limited.

2) Volumes:

The plant in the initial year will be slaughtering and processing 35 hogs per week. The average live weight of a hog is approximately 210 pounds. The intestines and paunch are removed to give a dressed weight of 173 pounds. The head and blood are then removed which leaves approximately 154 pounds of mainly edible product. Bones, additional blood and unusable fat must be accounted for which leaves approximately 129.11 pounds of saleable product. Table 1 shows the different cuts and total saleable output from 35 hogs.

As can be seen in Table 1, the yield from a hog is 129.11 pounds. The meat will be sold as fresh cuts or in a further processed form. The volume of meat produced by the plant initially will be 4,518.85 pounds per week. On an annual basis, the abattoir will produce 235,000 pounds of saleable product.

TABLE 1 - OUTPUT (35 hogs - weekly production)

Item	%	Pounds	Pieces	Total Pounds
Loins	20.40	31.42	70	1099070
Legs	24.00	36.96	70	1293.60
Picnics Hock On	11.50	17.71	70	619.85
Butts	9.00	13.86	70	485.10
Jowls	1.81	2.79	70	97.65
Bellies	10.50	16.17	70	565.95
Lean Trim	.07	.11		3.85
Regular Trim	3.67	5.65		197.75
Lean Belly Trim	.05	.08		2.80
Cutting Fat	4.33	6.67		233.45
Back Fat	2.07	3.19		111.65
Back Rinds	1.02	1.57		54.95
Belly Rinds	1.39	2.14		74.90
Other Rinds	.47	.72		25.20
Riblets	.58	.89	70	31.15
Neck Bones	1.51	2.33	70	81.55
Tails	.34	.52	35	18.20
Front Feet	1.01	1.56	70	54.60
Hind Feet	1.64	2.53	70	88.55
Side Ribs	3.81	5.87	70	205.45
Trim	.63	.97		33.95
Cutting Shrink	.20	.31		10.85
Sub Total	100.00	154.02		5390.70
less Inedibles		24.91		871.85
Total Saleable Product		129.11		4518.85

The production of the plant will increase by 35 hogs in year two and another 35 hogs in year three. Table 2 shows the volumes of meat produced by the plant in year 1, year 2, and year 3. The Table also indicates how each piece of meat will be processed.

TABLE 2 - OUTPUT POUNDS

Item	* PROCESS	YEAR 1 35 pigs	YEAR 2 70 pigs	YEAR 3 10s pigs
Loins	F	1099.70	2199.40	3299.10
Legs	FP	1293.60	2587.20	3880.80
Picnics Hock On	P	619.85	1239.70	1859.55
Butts	P	485.10	970.20	1455.30
Jowls	P	97.65	195.30	292.95
Bellies	P	565.95	1131.90	1697.85
Lean Trim	P	3.85	7.70	11.55

Regular Trim	P	197.75	395.55	593.25
Lean Belly Trim	P	2.80	5.60	8.40
Cutting Fat	P	233.45	466.90	700.35
Back Fat	P	111.65	223.30	334.95
Back Rinds	P	54.95	109.90	164,85
Belly Rinds	P	74.90	149.88	224.82
Other Rinds	P	25.20	50.40	75.60
Riblets	F	31.15	62.30	93.45
Neck Bones	F	81.55	163.10	244.65
Tails	FP	18.20	36.40	54.60
Front Feet	FP	54.60	109.20	163.80
Hind Feet	FP	88.55	177.10	265.65
Side Ribs	F	205.45	410.90	616.35
Trim	FP	33.95	67.90	101.85
Cutting Shrink		10.85	21.70	32.55
Sub Total		5390.70	10781.40	16172.10
less inedibles		871.85	1743.70	2615.55
Total Saleable Product		4518.85	9037.70	13556.55

* Index:

F	Sold as a fresh product.
FP	Sold as fresh and processed product.
P	Sold as a processed product

From Table 2, it can be seen that the majority of the hog has to be further processed into products such as sausage, jerky, etc.. The volume of meat produced attheabattoir will triple by year three to approximately 13,600 pounds per week or 707,200 pounds per year.

3) Fresh and Processed Product:

Pork products will be the raw material used in producing products for the retail and food service markets. The abattoir will be a supplier of meat products and should demand be greater than supply, the abattoir has the option to purchase similar products on the open market to meet this demand.

Products that will be processed are as follows: bone in and boneless hams, slab bacon, smokies, garlic rings and coils, salamis, link sausages and jerkies.

4) Other Potential Products:

Itis anticipated that some residents may wish to purchase their own livestock and have it custom killed and processed. Also, it is anticipated that hunters may wish to have their game meat processed. Many provincially inspected plants offer services of this type to hunters. There is a service charge

to skin animals, $30.00, a cutting charge of $.10 per pound and a curing/smoking charge of $.80 per pound.

Labels and Packaging:

All products that are produced or shipped from a this plant will be fully labelled. The labels provide information on the product being sold; ingredients, type of product and expiry dates. Initially, labels for our product will be printed by Labels Unlimited, a company based in Winnipeg, Manitoba.

The abattoir will package it's product in several different ways. The plant has the capability to package product in vacuum packs, trays, casings, netting, plastic sleeves and boxes. Packaging will be dependent on the product.

Distribution:

It has been determined that it would be too costly and impractical from a service point to operate a plant delivery system, except on a local basis. Inquirers have been ongoing with various transport companies to try and establish a service oriented delivery system to the following major communities:

-Fort Smith
-Fort Simpson
-Fort Providence
-Fort Resolution
-Yellowknife

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It has been estimated that it will cost the abattoir on average, $.10 per pound to freight product to these major centres.

Advertising:

Advertising is crucial to the success of this business. Congratulatory newspaper ads will be taken out when the plant becomes operational. Also, due to the fact that every major customer has special needs, customers will be invited to tour the facility and meet the staff.

SUPPLY

Supply of livestock for the abattoir was initially a concern as livestock production in the Northwest Territories is limited. However, the establishment of an abattoir will encourage livestock production in the Northwest Territories. Initially, the abattoir may have to purchase some of their livestock south of the border until such time as producers in the Northwest Territories become operational.

An analysis was completed on the supply of livestock in the Northwest Territories and in Northern Alberta. The results of the analysis are listed below.

NWT Livestock:

At the present time, there is one cow calf operation of 20 head operated by McBryan Farms in the South Slave Region. Recently, interest has been put forth by individuals to establish additional cow calf operations along with a feed lot.

There is a 100 sow farrow to finish operation in the South Slave Region. This operation produces approximately 35 market hogs per week. Discussions have been ongoing with the Department of Economic Development and Tourism in regards to increasing the size of the operation to a 250 sow farrow to finish operation. If this operation were to increase to 250 sows the anticipated production would increase to 90 market hogs per week.

Northern Alberta:

Agriculture is thriving in Northern Alberta and is home to several feedlot and hog operations. The majority of the livestock raised in this area is marketed in Edmonton. However, if a slaughter facility was built in Hay River producers in Northern Alberta would prefer to ship livestock to this facility as it is considerably closer than their market in Edmonton which would mean reduced freight costs.

Farmers in Northern Alberta were surveyed in June of 1992. The results of the survey indicate a strong interest from producers in shipping their livestock to Hay River to be slaughtered. The abattoir has been assured that this area can supply a minimum of 200 market hogs every week. Garrett Visser operates a livestock and inedible haulage company in Fairview and would be willing to ship these animals to the abattoir provided that the producers receive the same price as they receive in Edmonton.

In Manning, Alberta, Triple K Feeders would finish up to 800 cattle per year and ship north if the abattoir was operating in Hay River.

MARKET

Market Area:

The potential market area for the abattoir is the North and South Slave Regions. Communities included in this area are Yellowknife, Hay River, Fort Smith, Fort Simpson, Fort Providence, Fort Resolution, Kakisa, Enterprise and Fort Liard. The total population of these communities is 23,527 which represents 42.80% of the population in the Northwest Territories.

Once the plant is operational, the balance of the population in the Northwest Territories will be addressed.

Consumption of Red Meat:

In 1990, Peat MarWick Stevenson & Kellogg completed a study for the Department of Economic Development and Tourism on the consumption of red meats in the Northwest Territories. Table 3 lists the results of the study.

TABLE 3 - CONSUMPTION OF RED MEATS IN THE NORTHWEST TERRITORIES

YEAR	BEEF LB./CAPITA/Y=	PORK LB./CAPITA/YEAR
1984	84.6	62.1
1985	85.8	63.4
1986	87.1	61.6
1987	84.2	63.2
1988	84.5	64.6
Average	85.2	63.0.

From this study, it was determined that the annual consumption of beef is 85.2 pounds per capita and the annual consumption of pork is 63.0 pounds per capita.

The total amount of beef and pork consumed on an annual basis in the Northwest Territories and the North and South Slave Region is as follows:

	BEEF	PORK
NWT	4,686,000 LBS 7,460 CATTLE	3,465,000 LBS 20,260 HOGS
NORTH & SOUTH SLAVE	2,006,000 LBS 3,200 CATTLE	1,483,000 LBS 8,670 HOGS

From these results, the weekly consumption of pork and beef *in* the North and South 'Slave Regions was determined. The weekly consumption of beef is 38,500 lbs or 62 cattle and consumption of pork is 28,500 lbs or 180 hogs.

To determine what type of pork and beef products are consumed a survey, Appendix D, was completed in July 1992 by the Department of Economic Development and Tourism. The results of the survey indicate that for pork, 40% of the animal is consumed as fresh cuts (loins, ribs etc.) and the remaining 60% of the animal must be further processed into cooked, cured and smoked products (sausages, hams, bacon, blood pudding, etc.). For beef, processed product is sold along with fresh cuts.

The abattoir, as designed, will have the capabilities to process the above mentioned products.

Market Penetration:

In the first year of operation the facility will slaughter and process 35 hogs per week. This represents approximately 2% of the consumption demand in the North and South Slave Regions.

The amount of market penetration by the abattoir in the first year is supply driven. With the support the abattoir has received from retailers in the market area the initial market penetration is considered to be very low. By Year 3, market penetration increases by 40% which is considered to be attainable.

The red meat industry in the past few years has been taken over by large conglomerates, with diverse integrated interests and strong ties to Pacific Rim and American Markets. The food service market in the Northwest Territories is currently being serviced by Canada Packers, Edmonton Meats and Burns Meats from Yellowknife.

These companies have been able to ship into the Territories exactly what retailers require to service their customers. The abattoir must have the same capability and at the same time, produce a fresher, higher quality product.

In comparing the results of our survey to the output from the abattoir, there should not be any problem selling all cuts, either

fresh or in a processed form in the Northwest Territories. There are letters of support, Appendix E, for the abattoir from retailers and distributors in the Northwest Territories.

Pricing:

Peat MarWick Stevenson & Kellogg indicated in their 1990 market study that there was a premium paid by retailers for beef and pork products. In a recent price survey conducted by the Department of Economic Development and Tourism, it was found that no premiums were paid and that prices were very competitive with retailers in Southern Canada. However, it was found that prices on average were approximately $.10 per pound higher mainly due to freight charges.

This survey was conducted to determine prices paid for fresh pork cuts and processed meats by retailers in the North and South Slave Regions. Table 4 lists the cuts of fresh pork, pounds per animal, price per pound and the value of the cut.

TABLE 4: PRICES OF FRESH PORX CUTS

Item	Pounds	Price/LB	Value
Loins	31.42	$ 1.66	$ 52.17
Legs	6.17	1.23	7.59
Riblets	.91	.57	.52
Neck Bones	2.34	.53	1.24
Tails	.54	.55	.30
Front Feet	1.57	.51	.80
Hind Feet	2.54	.51	1.30
Side Ribs	5.86	.45	2.64
Ears	.40	.20	.08
Tongues	1.51	.91	1.35
Kidneys	.41	.51	.21
Livers	2.52	.44	1.11
Hearts	.52	1.09	.57
Totals	56.71	1.23	69.88

The results of the survey indicate that the average price per pound of fresh cut pork is $1.23. It has been estimated that 56.71 pounds per hog can be sold as a fresh cut product. Therefore, revenue from the sale of fresh cuts per hog is $69.S8.

The survey also determined prices paid by retailers for cured, cooked, and smoked products which could be processed at the abattoir. Retailers 'on average, with the exception of features, apply a mark up to their cost price to arrive at a selling price. Table 5 lists prices for product that could be processed at the abattoir.

TABLE 5 - PRICES OF PROCESSED PRODUCT

Item	Retail	Wholesale Price
Slab bacon	$ 2.72	$ 1.14
Jerky	16.98	11.72
S/C Wiener	4.30	2,97
Smokies	4.30	1.94
Smoked Boneless Picnics	3.40	2.35
Boneless Dinner Hams	3.99	2.75
Olde Fashion Hams	4.49	3.10
Black Forest Hams	4.49	2.84
Cottage Roll 4"	3.54	2.44
Bologna Pieces	2.58	1.78
Pepperoni	5.08	3.51
Back Bacon Pieces	6.76	4.66
Smoked Mennonite Farmer Style Sausage	2.67	1.84
Kolbassa 300g	2.94	2.03
Fine Garlic Sausage	5.15	3.50
Roasted Pig Tails	2.06	1.42
Beef sausage L/Casings	2.98	2.06
Pork Sausage S/Casings	2.99	1.50

The prices listed in Table 5 represent the lowest prices obtained. In order to determine the price and revenue from processed products the amount of raw material and the type of products must be identified.

Table 6 lists the balance of product from a hog that is not sold fresh which will have to be converted into a further processed product. The weight of the raw material listed in this table is on a boneless basis.

TABLE 6 - AVAILABLE BONELESS RAW MATERIAL PER HOG

ITEM	WEIGHT LBS.
Legs	18.5
Picnics Hock On	12.7
Butts	13.2
Jowls	2.8
Bellies	16.2
Lean Trim	.1
Regular Trim	5.7
Belly Trim	.1
Cheek Meat	.3
Head Meat	.3
Water and Spices	2 . 5
TOTAL WEIGHT	72.4 LBS

Below are five formulations to convert this raw material into a processed product. Using prices from Table 5 the revenue from the sale of processed products per hog can be determined.

1) Slab Bacon - 16.2 lbs of Bellies.
Revenue: 16.2 lbs X $ 1014 = $ 18.44

2) Garlic Rings, Coils - 8.6 lbs of Legs & 2.9 lbs of Picnics Hock On.
Revenue: 11.8 lbs X $ 3.50 = $ 41.40

3) Toupie & Black Forest Hams - 9.9 lbs Legs.
Revenue: 10.8 lbs X $ 2.84 = $ 30.67

4) Smokies - 13.2 lbs of Butts, .1 lb of Lean trim, 5.7 lbs of Regular trim, .1 lb of Belly trim, .3 lbs of Cheek Meat & .3 lbs of Head Meat.
Revenue: 19.4 lbs X $ 1.94 = $ 37.69

5) Fresh Linked Italian, Bratwurst & Pork Sausages - 9.9 lbs of Picnics & 2.8 lbs of Jowls.
Revenue: 14.2 lbs x $ 1.50 = $ 21.30

Using these five formulations it was determined that the revenue for processed products per hog is $149.50.

Table 7 summarizes the amount of product that can be sold as fresh or in a processed form, average prices and revenue per hog.

TABLE 7 - GROSS RETURN PER HOG

ITEM	LBS	AVERAGE SELL PRICE/ LB	REVENUE
Fresh Pork Cuts	56.71	$ 1.23	$ 69.88
Processed Products	72.40	$ 2.06	$149.50
Total	129.11	$ 1.70	$219.38

CAPITAL REQUIREMENTS

Capital items that are required for this project are as follows:

Sit. Preparation:	
Clearing of 15 acres	$ 13,000.00
Geophysical for 4 holes	$ 12,000.00
Concrete for building	$ 50,000.00
Roadways	$ 25,000.00
Truck basin	$ 25,000.00
Total Site Preparation	$ 125,000.00
Additional Facilities:	
Freshwater/Waste water2 x5,000 gallons	$ 20,000.00
Hide Building 24' x 24'	$ 30,000.00
Inedible Trailer 8' x 40'	$ 25,000.00
Packaging Trailer 8' x 40'	$ 10,000.00
Lagoon Cell	$ 50,000.00
Total Additional facilities	$ 135,000.00
Equipment:	
Kill Floor Equipment	$ 90,000.00
Processing equipment	$190,000.00
Total Equipment	$ 280,000.00
Transportation:	
Vehicles	$ 60,000.00
Total Transportation	$ 60,000.00
Main Building - Abattoir:	
Unit#l, Mech/laundry/Inedible	$ 71,820.00
Unit # 2, Kill Floor	$ 71,820.00
Unit # 3, Freezer/Process/Cooler	$ 71,820.00
Unit # 4, Cooler/Sausage/Smoke	$ 71,820.00
Unit # 5, Shipping/Parking/Chill	$ 52,720.00
Unit # 6, Office Area	$ 28,000.00
Unit # 7, Barn Area	$ 28,000.00
Installation, Freight, Design	$ 120,000.00
Total Main Building	$ 516,000.00
Total Capital Costs	$1,116,000.00

The estimated capital costs for this project is $1,116,000. Capital costs were based on firm written and verbal estimates from southern and northern companies.

Through the tendering process the capital costs estimated for this project may change as the Northern Preference Policy may increase capital costs as much as 15%. Under the Northern Preference Policy, a northern contractor may be awarded a contract if their bid is within 15% of a southern contractor. Therefore, capital costs for this project may be underestimated by 15% or $167,000.