

**MULTI LOCATION ABATTOIR**  
**FINAL REPORT**  
**2009**



Freedom To Create. Spirit To Achieve.

### **Acknowledgements:**

This project was not possible without the help of many people in many different organizations.

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### **Partners:**

The project would not have been possible without the hard work and dedication of all the Partners. The three main partners were:

- Olds College, Meat processing/school of animal science
- Alberta Agriculture and Food, Business & Diversification Branch, Meat Inspection, And Food Safety Division
- Lacombe Research Centre, Agriculture and Agri-Food Canada

### **Individuals:**

This project was not possible without the hard work and dedication of many individuals at various stages of the project.

For more information on this report and the actual practical workings and cost of the MLA please call either of the following two individuals:

Brad Mcleod, Olds College 403 556 4792 or E mail [bmcleod@oldscollege.ca](mailto:bmcleod@oldscollege.ca)  
Brad is the best person to talk to about the meat end and the actual work that went on inside the Abattoir such as skinning, gutting etc.

Bert Denning, Alberta Agriculture, 780 674 8247 or E mail [bert.denning@gov.ab.ca](mailto:bert.denning@gov.ab.ca)  
Bert is the best person for questions about the trailer itself and the mechanical aspects of the unit plus the outside work and costs involved.

# **MULTI LOCATION ABATTOIR FINAL REPORT**

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## **1. Executive Summary**

*Phase One* of the project “Technical & Feasibility of Multi Location Abattoirs” was started in 2006, with the idea of building a trailer that could go onto the farm and slaughter large animals thereby producing a provincially inspected carcass.

There were many meetings and ideas discussed before an agreement was made for the final trailer blueprint. In the spring of 2007, the “Multi Location Abattoir” (MLA) was ordered from Trivan, a company out of Washington State (*Phase Two*). The trailer was delivered to Olds College in January of 2008. This report highlights the results of *Phase Three*, which was the testing of the MLA on-farm throughout Alberta.

After delivery to Olds, a Written Operating Procedures and Hazard Analysis Critical Control Points (HACCP) based plan was written for the MLA. These were submitted to meat inspection for their approval in the spring of 2008. In April 2008, two test runs were completed on two cattle and one hog at Olds College. After minor repairs and modifications, a green light was given by the Regulatory Services Division of Alberta Agriculture and Rural Development. A license to operate a Meat Facility Abattoir was issued and the Abattoir went on the road.

From April 2008 to November 2008 the Abattoir traveled over 7000 kilometres in Alberta and slaughtered 154 head of livestock. The Abattoir slaughtered five different species including Cattle, Hogs, Sheep, Deer and Bison. The animals were slaughtered in various locations, situations, different weather conditions and with a huge variation in animal size (100 lb sheep to 1800 lb cattle).

The Abattoir performed as expected and produced ‘provincially inspected carcasses’. The Microbial Baseline Study (Attachment) showed that the Abattoir could produce a clean carcass from a microbial stand point. There was no need to cancel slaughter days for any reason (Weather or Mechanical Break down).

Most of the mechanical problems involved plumbing and electrical systems which were deficient only due to the poor workmanship from the manufacturer. Any problems had been resolved within the first month and everything went along as planned. Structurally the trailer was well built and worked very well.

The most significant costs were labor, diesel fuel and ownership costs (principal & interest). It took about 40 man hours (3 people) to do a full day of slaughter, including driving time and unloading. The inspector cost was on top of this. Diesel fuel for the truck and trailer was approximately \$300 for a typical full day kill which included getting the carcass cool enough to unload. The ownership cost would depend on the terms and initial cost of the unit plus the amount of use and could easily be in the \$600 to \$1000 range per slaughter.

Overall, the study was very successful. It proved that a ‘provincially inspected abattoir’ could be built as a mobile unit and still produce safe carcasses right on the farm.

## **2. Project Overview**

Develop and test a prototype multi-location abattoir for the slaughter of a wide variety of livestock in various conditions. Specifically to address the needs of livestock producers (especially Bison, Deer and Elk which do not travel well) and alleviate a shortage of Provincially Inspected slaughter capacity. In addition, promote the recruitment of skilled workforce for the meat industry; capitalize on niche markets and support livestock producers and rural communities.

### **a. Project History**

The project from initial idea to finished unit to testing took a number of years to complete and was divided into three phases:

**1: Phase One:** In this phase various experts in the meat industry had numerous meetings planning and discussing what should be in a 'Provincially inspected Mobile Abattoir'. This plant had to be at par with even the best existing plants. It was also decided that the MLA had to meet HACCP requirements. This phase took about 2.5 years of meetings and discussions with the completed Abattoir delivered to Olds in January of 2008.

**2: Phase Two:** In this phase operational procedures and HACCP plans were created. A full time coordinator was hired by Olds to oversee both phase two and phase three. Once operational procedures and the HACCP plan was completed the Abattoir had to be okayed by the meat inspection branch of Alberta Agriculture. This phase was completed in April of 2008.

**3: Phase Three:** In this phase the unit was taken on the road and went to various locations throughout Alberta slaughtering various livestock. Olds College purchased a used tandem axle hi-way tractor to haul the Abattoir around the province. The rest of this report will go into detail about the various problems, pros, cons, costs, etc regarding Phase Three.

### **b. Partners:**

- **Olds College**, School of Animal Science (Meat Processing Program)
- **Alberta Agriculture, Food and Rural Development.**
  - Business Development
  - Meat Inspection Branch (Food Safety and Regulatory Services)
- **Lacombe Research Centre**

### **c. Objectives:**

Design and construct an inspected mobile slaughter facility to assess technical, economic and regulatory factors of mobile slaughter in Alberta and beyond. Through pilot testing this prototype will assess the following factors:

#### **i. Technical**

- Test the logistics of mobile operations at various locations and during different seasons.
- Develop and test slaughter procedures for a multi-location plant.
- Test slaughter of a cross section of large livestock species.
- Test the maximum capacity of multi-location operations for different species.
- Develop curriculum and train personnel to operate a mobile slaughter plant.
- Conduct bacteriological studies to assess meat safety within a mobile plant.
- Conduct consumer quality study investigating the effect of pre-slaughter and transportation stress on meat quality for different species.
- Developing guidance for future designs of inspected mobile plants of various capacities.
- Design and testing of waste utilization/disposal protocols and develop best practices for mobile plants.
- Demonstrate multi-location slaughter operations and provide relevant information to all interested parties from Alberta and beyond.

#### **ii. Economic**

- Developing business scenarios and define market niches in which mobile slaughter may provide a competitive advantage.
- Define cost of slaughter in a multi-location abattoir.
- Financial analyses of a meat marketing venture that utilizes mobile slaughter.
- Promote rural recruitment to pursue education in trades and career paths to meet urgent needs of the diversified meat processing industry
- Showcase a successful niche livestock initiative that incorporates mobile slaughter

#### **iii. Regulatory**

- Update regulations and guidelines that will allow operations of inspected multi-location slaughter in Alberta
- Design a multi-location slaughter system (operating and transporting units) that meets Alberta Meat Inspection guidelines
- Develop and test Food Safety System for multi-location abattoirs

### **3. Facility Design:**

#### **a. Background**

The design goals of this project were to design and construct a Mobile Slaughter Facility that meets Alberta Regulatory Standards.

The Mobile Abattoir was designed to slaughter the following variety of species with the capacity to harvest any of the following in the equivalent of Ten Beef per day.

- Ten Beef per day
- Twenty hogs per day
- Thirty Five Sheep per day
- As well as a similar number of Bison, Elk, Deer, and goats.

The Coolers of this plant were designed to hold 1 day's worth of kill for example ten beef and is designed to operate below four degrees Celsius to ensure proper carcass cooling.

The design allows the plant to operate at a slaughter rate of two beef an hour and contains enough water to wash the carcasses and clean the plant after slaughter.

#### **b. Unit Description:**

The MLA unit is a very large unit consisting of a trailer that is 53 feet long, and very low to the ground. This makes it very difficult to maneuver in tight locations. The ideal slaughter location is a level pasture where the grass is thick with no dirt spots. Also the drive way has to be wide enough for the truck and trailer to make the turn.

The trailer is pulled by a tandem axle high way tractor. The tractor used was a 9000 international with a 500 horse power cat engine. This was plenty of power for pulling the trailer. This tractor had the capability of locking all the back axles together. This is very important as this was used a number of times in muddier conditions or to get out of tight situations. The tractor also had a sleeper which was used many times during the summer as the unit was parked as the cooler ran to cool down carcasses. The sleeper also gave some extra space for storing equipment, ammunition, guns and other stuff accumulated during the study.

The trailer itself is divided into 4 sections. The back section has two large top to bottom doors that open wide to receive the carcass. The carcass is bled outside the unit and then hoisted up using a winch on a large I beam. This I beam extends out 8 feet at the back and rides on rollers.

The back room is where the head is removed, the carcass is skinned and all the dirty parts are removed. The larger carcasses are lowered into a cradle and skinned. Two winches are available in the back room to hoist and move carcasses around. There is a rail on the ceiling which starts in the back and goes right to the front of the cooler. Once all the dirty parts of the carcass are removed it is hung on the rail and transferred to the second room.

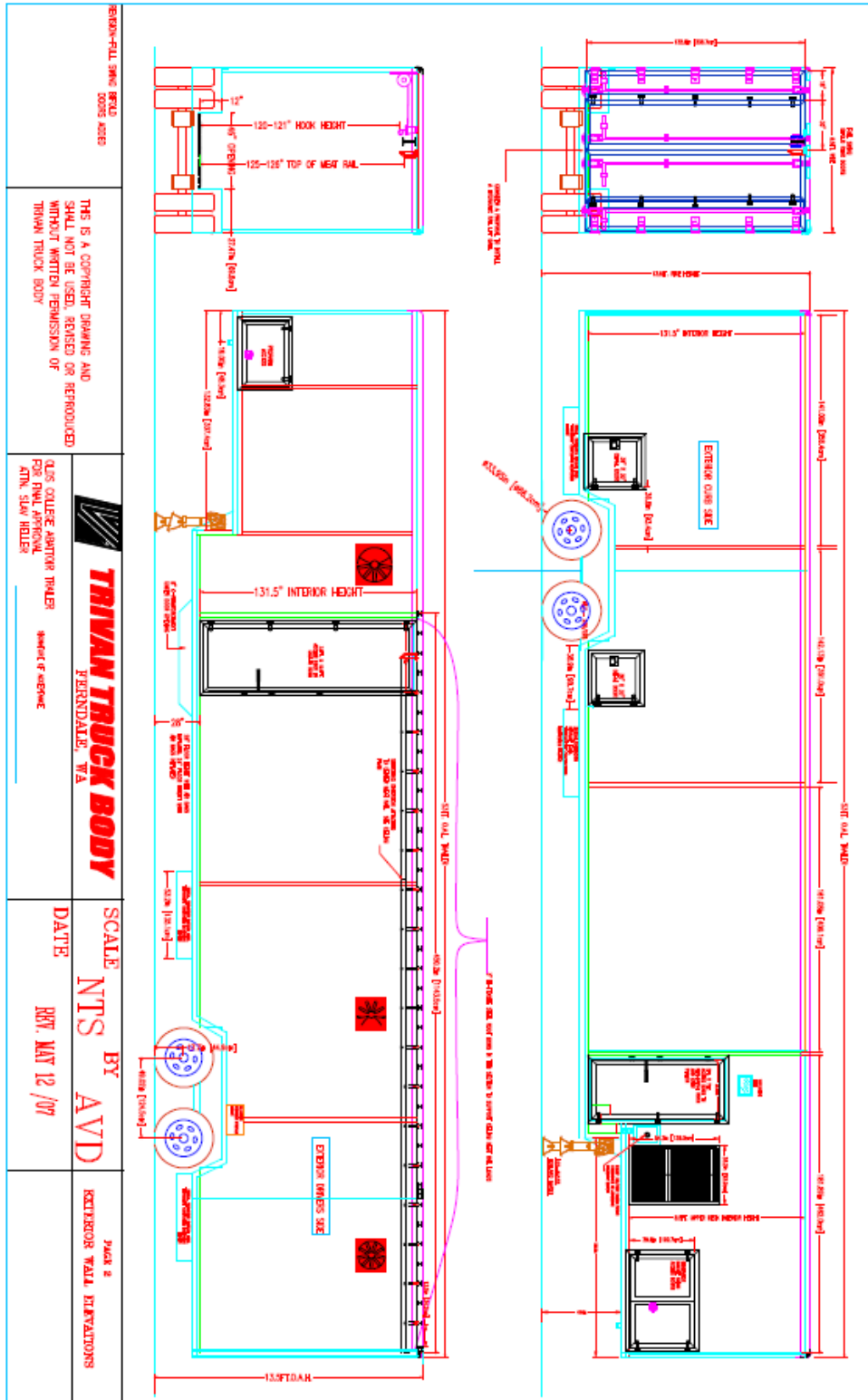
In the second room the guts are removed and the larger carcasses are split. The carcass is prepared here and then put in to the third room which is the cooler. The cooler has three rails with switches so that any carcass can be moved any where on rails inside the trailer.

These three back rooms are the working part of the unit.

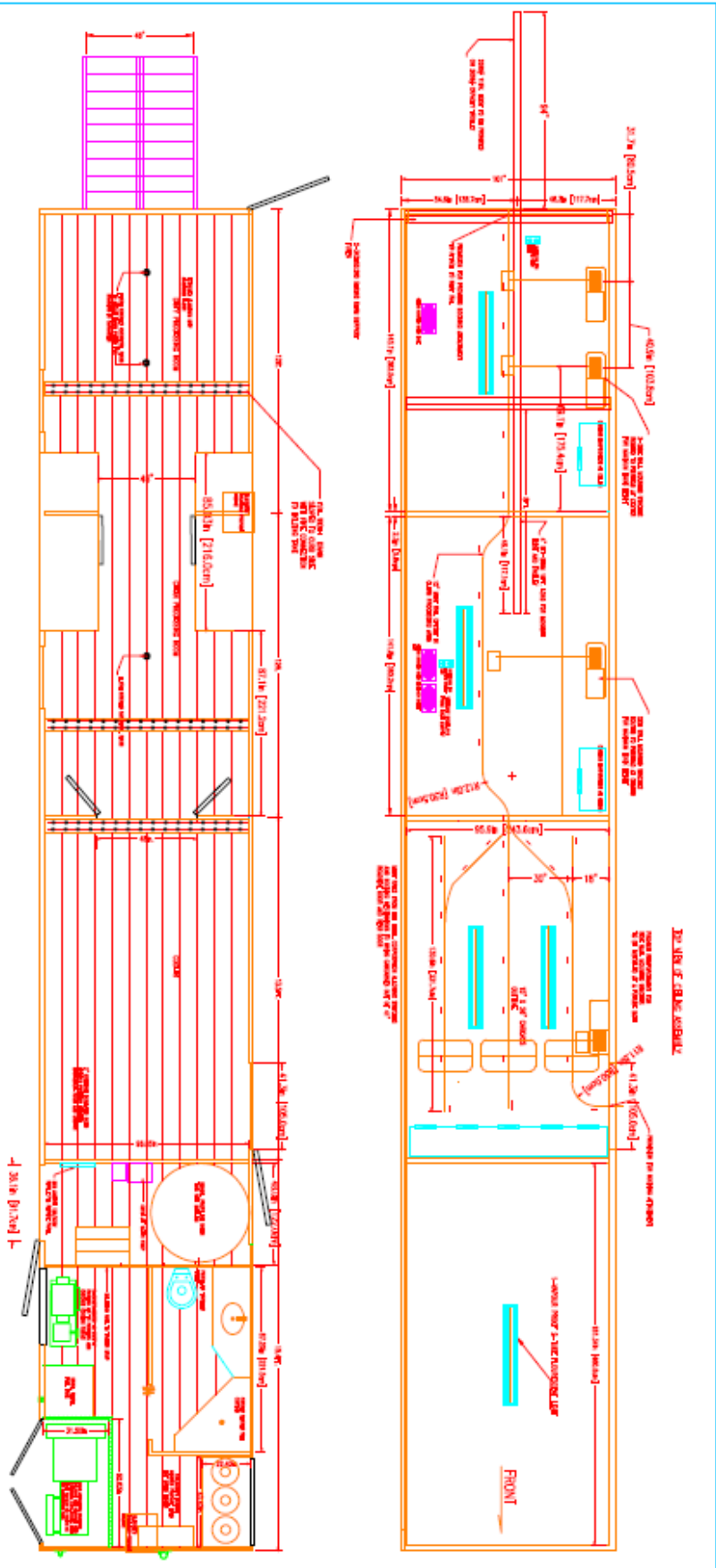
Outside and near the front is a man door which gives access to the front of the unit. In the front is the machinery that keeps the unit going. Here there is a bathroom with sink, toilet and shower. There is a 500 gallon fresh water tank, the cooler compressors, an air compressor, diesel tank and generator and propane storage. This is also where all the storage of knives, coveralls, bags etc get stored. And is also where the two electrical breaker boxes are located.



### c. Final Drawings



<p>REWORK-FULL SIZE REV. L DOORS ADDED</p> <p>THIS IS A COPYRIGHT DRAWING AND SHALL NOT BE USED, REVISED OR REPRODUCED WITHOUT WRITTEN PERMISSION OF TRIVAN TRUCK BODY</p>	<p><b>TRIVAN TRUCK BODY</b> FERRISDALE, WA</p> <p>DESIGNER: JAMES H. HARRIS DATE: MAY 12 / 07</p>	<p>SCALE: NTS BY: AVD</p> <p>DATE: MAY 12 / 07</p> <p>BY: AVD</p> <p>EXTENSION WALL DIMENSIONS</p>
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- MAY 12 REVISION SHOWING
- 1- JIB CRANE REMOVED
- 2- SLURR BEAM ADDED WITH 8-FT. EXTENSION
- 3- CEILING REINFORCEMENT FOR HOIST IN COOLER ROOM
- 4- 2-6FT. x 2FT. DEMONSTRABLE ALUMINUM RAWS WITH 23 SLOPE TO FLOOR


**TRIMAN TRUCK BODY**  
 FREDSDALE, VA  
 SOURCE OF ASSISTANCE

SCALE BY  
 NTS BY  
 DATE MAY 12/07  
 AVD  
 PG. 4 POOR PLAN  
 CEILING PLAN

## **4. Technical Assessment**

### **a. Operating Plans:**

#### **i. Pre-slaughter Procedure**

Before slaughter begins at any location the trailer has to be made ready for pre-slaughter  
Inspection and the overall situation has to be assessed to make sure it is welfare friendly and safe to proceed. The following has to happen even before slaughter begins.

- A site has to be chosen that is well drained and level and preferably on pasture
- The trailer has to be leveled. This involves positioning the whole unit as well as using boards under the wheels as needed.
- The abattoir needs to be inspected by staff to make sure it is clean and all systems are working. This means starting up the unit, letting it warm up and then testing all the systems.
- The actual slaughter site has to be checked to make sure the animals can be restrained humanely and safely.
- There needs to be a tractor with a front end loader to bring the carcasses to the abattoir and haul away the blood and offal.
- There needs to be adequate fire arms to humanely shoot the animal. The larger the animal the bigger the gun.
- There need to be enough containers to collect the blood as well as hold the offal and hide.
- The inspector needs to observe the first slaughter to make sure it is done as humanely as possible.
- The inspector needs to inspect the abattoir and give the okay before the first slaughter takes place.

#### **ii. Beef/Bison Dressing Procedure:**

- **PURPOSE:** To ensure beef skinning and head removal is performed to meet Inspection requirements and reduce/eliminate as many potential contamination hazards as possible.
- **WHO:** Receiving/inedible room workers.
- **WHEN:** Each and every beef carcass that is received for processing.
- **WHAT/HOW:** Procedure will begin once the animal has been received into the MLA and rear receiving doors are closed.
- Carcass will have been rendered dead and bled outside the unit, head still attached.
- The carcass will then be placed on the skinning cradle by positioning the shoulders at one end of the cradle, and lowering the hoist while at

the same time pulling on the beef's tail to position the carcass as evenly as possible on the cradle.

- The head is scalped.
- The head will be removed and presented for inspection as per Meat Inspection Branch (MIB) Directive.
- Remove hooves. Open hind legs to expose the ankle joint and separate. Front hooves can be removed via separation with hide on.
- Rinse your hands and apron often to maintain as clean a presence as possible. Rinse and sterilize your knife as required and frequently to reduce contamination.
- Place all hooves in inedible container or dispose of through side door, into inedible receptacle.
- Create midline opening, from brisket to anus.
- Perform skinning. One side at a time.
- Pull hide away from and down so that dirty hide does not contaminate freshly skinned carcass.
- Make cuts to expose hind and front legs as you reach each limb; again ensure dirty hide is completely reflected to avoid contamination.
- Skin carcass down to the top of the cradle.
- Wash/rinse hands and equipment (knives/scabbard etc.).
- Split the brisket.
- Rod the weasand as per Meat Inspection Branch directive.
- Trim any visible contamination from exposed carcass that may have occurred during the skinning process. In particular the midline and leg opening cut areas.
- Gam and roller the carcass.
- As carcass is hoisted upward to the rail, continue skinning the hide until the carcass is fully suspended, and the hide drops on the floor.
- Inspect the exterior of the carcass for any remaining contamination, as before, use a clean knife to trim off.
- ***DO NOT USE WATER HOSE TO "RINSE OFF" CONTAMINATION. IT MUST BE CUT / TRIMMED OFF!!***

Carcass is now ready to be pushed into the edible area of the plant for further processing.

### **iii. Beef slaughter Clean room procedures:**

Keep door between clean and dirty room closed except to receive a carcass.

- Eviscerate the carcass by opening it up the midline and pulling down the rectum and carefully disconnect the kidneys from the paunch.
- Push down on the paunch until it falls on the floor being careful to leave the liver inside the carcass.
- The intestines are inspected and removed out the side door of the mobile abattoir.
- Remove the liver from the carcass.
- Cuts through the diaphragm and down the backbone while pulling on the lungs and the heart to removed from the chest cavity and removed the pluck from the carcass.
- Remove the kidneys from the carcass.
- Wash and sterilize your knives as needed and practice good hand washing between jobs.
- Split the carcass down the backbone.
- Remove all spinal cords and trim the carcass.
- If the animal is OTM over 30 months the backbone must be removed at this stage this is accomplished by using a well saw and cutting down each side of the backbone about 1 inch into the meat ensuring that all spinal cord and dorsal root ganglia are removed.
- Wash the carcass and present for meat inspection.
- After inspector approval tag to carcass and place in the cooler.

#### **iv. Hog Slaughter Procedures:**

- Hogs are stunned outside the trailer using the electrical stunning scissors.
- Once the animal is stunned and insensible they are hung by the back leg and bled.
- The hogs are then winched into the trailer using the overhead hoist.
- The hog is then laid into the cradle his feet are removed and the animal is skinned down to the cradle.
- The animal then hoisted the remainder of the skins pulled off the back and the head is removed.
- The animal is then moved to the clean room where it is eviscerate it similar to beef and split down the center trimmed, washed and presented to inspection.

#### **v. Lambs/deer slaughter procedures:**

- Lambs and deer are stunned outside of the trailer using either electric or 22 shot.
- The lambs and deer are then bled while they are suspended from a front end loader.
- The animals are then winched into the mobile trailer using the overhead hoist.
- The heads are removed and presented to inspection.
- The hind legs are opened up chains are placed around the wool or hide and attached to the floor.
- The hide is then removed from the carcass pulling it like it tube this method allows for very clean hide removal.
- The animal is then bunged and moved to the clean processing room.
- In the clean processing room the animal is eviscerated liver and pluck presented to the inspector.
- They are then trimmed washed and weighed after inspection they are placed in the hanging cooler.

### **c. A Typical Slaughter day**

A typical day would involve picking up the unit at a home base. In this case it was Olds College. Before leaving, the tractor and trailer must be inspected for safety. The tires, brakes, oil, lights, brakes etc must be checked. This might take 15 to 30 minutes. The unit will already be clean and the fresh water tanks filled up.

The unit will then be driven to a farm-site somewhere. If the home base was within 1-2 hours from the farm, the unit was scheduled for departure early on the day of slaughter; otherwise the unit would leave the night before to get there on time. A typical day could start at 5 or 6 a.m. to ensure the unit arrived by 7:30. After arriving, the generator is started and everything is turned on to make sure it works. Besides the driver and outside guy there needs to be two other people working inside the trailer. All these people must be there by 7:30 to get things ready. The inside is checked and possibly some cleaning is done. Water needs to be added to the sterilizers, and the coolers and/or heaters need to be working. Once every thing is a go, the unit is ready for the meat inspector to give the okay to begin. The meat inspector will arrive around 8 and usually give the okay pretty quick. The meat inspector has the power to stop or start the day at any time. For example if it is pouring rain, or the livestock have a welfare issue, the inspector can stop everything until corrective action takes place.

Once the go ahead is given the first animal is prepared. The animal has to be confined in a way that it can be shot or stunned safely and with no welfare concerns. A squeeze with side opening doors works the best. If a pen is used it needs to be small (10 feet by 10 feet) as an example. Most of the animals can be shot with a 22 above the eyes and downed with one shot. In Stettler, a 22 caliber captive bolts was used and worked well. For the sheep and hogs an electrical stunner was used and worked well. For the bison a 357 caliber rifle was used for most of them. A larger 300 magnum or 303 British was used with older animals and because some shots were from a distance.

After the animal is shot it is hoisted up as quickly as possible. On the farms a front end loader was used and worked well. The animal was bled into a plastic container near the place of shooting. Once bled out the animal is brought to the back of the Abattoir. At the back of the Abattoir the hoist on the I-beam is used. The opposite front leg is tied with a short chain and the carcass is hoisted up. As the front goes up the farmer starts to lower the carcass. Then the opposite back leg is tied with another short chain and this chain is also attached to the Abattoir hoist. The chain on the loader is now released and the tractor can back away. The animal is now hanging with all 4 legs up and the back to the ground.

The animal is now pushed by hand into the Abattoir and lowered on to a cradle. The cradle is used for cattle and bison and larger animals. The smaller animals are handles a bit differently but principles are the same.

Once the animal is in the back room the I-beam is pushed in and the back doors are closed. This transfer from the loader into the Abattoir can take from 5-10 minutes while the back doors are wide open. This is a real concern in cold weather or if there are lots of insects or wind and dust.

Once the first animal is in the two inside people start to remove the head, hoofs and skin and get the animal hanging on the rail. Once the first animal is in the outside person can start getting the second animal ready. The first animal in the trailer goes pretty fast because two people can work on the one and there is nothing ahead to hold things up. The speed of skinning is totally dependent on the size of the animal and the fat cover. A young fat steer/heifer will go quickly while a large thin cow can be very slow.

For cattle if the outside guy waits about 10 minutes the next animal can be shot and bled and brought to the back of the Abattoir. By this time the first animal is being put into the second room. The back room has to be washed to remove all the blood and hair of the floor and then it is ready for animal # two. The door is again opened and the process repeats itself. The rest of the day is dictated by the speed of skinning and getting the animal out of the first room.

In the mean time the first animal is being gutted, split and cleaned in readiness for the trailer. The inspector is moving between the outside and the first two rooms doing what inspectors do. Once the first animal is in the cooler the second room fellow can start helping the skinner finish of number two.

Once the process starts things usually fall into a routine. Every farm, farmer and tractor is different and does play a role in how smoothly things go. On the side of each of the back rooms is a small door where the waste is removed. This is the outside person's responsibility. This person has to physically remove the hide head and feet from the back room and physically remove the guts and stomach from the front room. This is dirty and hard work. The outside person has to be constantly washing hands and boots apron and knives. This means a hose has to be attached to the water supply and stretch out to the back of the trailer the whole day. This is fine in the warm months but can be a concern in cold weather. The outside person is also wet most of the time because of the blood, guts and water used.

The inside work is also very hard work physically. There is a lot of bending over, it is wet and can be slippery. The work is also dangerous, animals kick, they fall, knives are used and you are dealing with a wet and slippery situation.



Once the cooler is full the two back rooms need to be cleaned. This can take from 1-1.5 hours as the floors were not easy to clean and there is a lot of fat, blood and hair everywhere. Once the back rooms are cleaned the unit is left running to cool at the farm or the carcasses secured and the unit driven somewhere. Either way the diesel generator is left running to cool the carcasses.

So a full day killing 10 beef (or equivalent) with the farm being 1 hour from the base is a long day. Three workers are needed. The day will start around 6 a.m. and with every thing going smoothly will end back at the base between 6-7 p.m.

This means there are three people working 12 hours (36 man hours) for 10 head of beef. On top of this, is the time for an inspector and a farmer and his tractor for a day. If one person has to stay behind for a day or two then there are another 12-24 man hours. If the carcass is not unloaded into another provincially inspected facility then the unit has to run 48 hours before unloading. This is a lot of time and diesel. The largest animals take the longest to cool, and 48-52 hours is the longest time for the largest animals going down to 4 degrees Celsius.

Once the carcasses are unloaded the unit needs a thorough cleaning from top to bottom. This can take 2-4 hours with a high pressure sprayer. Unless the carcasses are unloaded the same evening and then the trailer pressure washed it would be difficult to have back to back kill days. Because of labor and time a slaughter every second day is the most likely scenario.

So a typical kill day is a long 12 hour day for three workers plus another half day for cleaning, and then labor for a few people to unload which could also be a couple of hours. Overall 40-50 man hours per kill day, is not unusual.

## **5. COSTS**

### **a. Truck Costs:**

From April till the end of October the truck was driven 7532 Km. Most of the traveling is with an empty trailer (No Carcasses) but half the traveling is with the water tank full and diesel tanks full and after the kill the return trip was usually with the water, waste and diesel empty or mostly empty.

The total diesel used was 3300 litres for the tractor. This diesel was used to drive 7215 Km (the last fill was Barrhead). This works out to 2.187 km/Litre or about \$0.50.km.

We did not have a lot of maintenance cost because the truck had been well taken care of and safety inspected before Olds purchased it. And our mileage

was low compared to what a truck like this would normally drive. But normal wear and tear (oil, tires, small things) do add up and major repairs (transmissions, engines) are very expensive. But to use a figure of \$.50/km for maintenance is also very realistic.

## **b. Trailer Costs:**

The trailer has a number of systems such as heating, cooling, electrical, air, and a water system. Each of these systems has costs attached to it.

Heating: The heating system consists of two propane fired RV heaters. One heater is in the front compartment under the water tank. The second heater is between the back two rooms and heats the back of the trailer. The heating system was only used on a few days in September and October. Costs associated with this system are propane and maintenance. The front heater was under the fresh water tank and had no access. The water tank was installed after the heater and thus blocked it. A hole and access panel had to be installed through the outside wall to gain access to the heater.

The back room thermostat and computer board were both corroded and rusted before even being used. These were replaced in September and then the heater worked well. Since the propane operated both the water heater and the heaters it is impossible to know how much propane was used for heat. The total propane use will be discussed later.

Cooling: The trailer has three cooling systems. There is one large compressor and evaporator for cooling down carcasses. This system had a few minor problems with the thermostat but overall worked well with no major break downs.

There are also two smaller compressors and evaporators for each of the back rooms. We had no mechanical problems with these but during hot weather they did not keep the rooms as cool as wanted. Part of the problem is the constant opening of the back doors letting in hot air and then the cooler trying to constantly play catch up.

All of this equipment was brand new in 2008. There is no question that repairs and maintenance of the cooling system could be costly in the future and needs to be budgeted for.

Electrical: There were a lot of problems with parts of the electrical system from the start. The diesel generator worked well and was not a problem. The generator did quit on us 3-4 times because of overload on the electrical. But it started up fine after each incident.

The main problem was with having minimal wiring in the back two rooms. For example the two sterilizers did not work when plugged in but blew the breaker, so only one sterilizer could be used. More and more problems showed up during the summer. There was a point where an extension chord was run from the front outside to the back to keep things running. An electrician was hired in Stettler and two more circuits were run to the back rooms. After this the electrical worked fine. The big cost here is diesel fuel for the generator plus oil and filters needed to maintain the engine running well.

**Air System:** This system consisted of an air compressor in the mechanical room with lines running to the back of the trailer. This system worked reasonably well. The compressor breaker did blow on occasion but this was more an electrical problem.

The lines on the lift got tangled up and broke on one occasion but this was repaired quickly. In the colder weather the compressor lines were starting to freeze up. This would be resolved if the line were blown out after every kill in the winter.

**Water Plumbing System:** This system caused us regular frustration and grief. When the system was first started it was discovered that lines had been cut through at manufacture and had to be repaired, propane fittings were loose and many other things needed repairing. Plumbers at Olds spent several days repairing and getting the plumbing working. The plumbing had not been checked before the trailer left the factory. This was repaired but still problems kept popping up. This involved a fair amount of labor costs to get things working.

The instant propane heater worked most of the time but did stop working more often than wanted. Usually shutting of the propane and restarting got it going. But there were also too many occasions when only cold water was available. The system was temper mental. This is both a cost in time as well as frustration. The main cash cost was the propane used to heat the water. But this cost was relatively minor compared to diesel costs. The total propane used for the 7 months and 156 head was 200 pounds. This works out to a little over \$1/head.

The other constant problem was the water pressure system. The small lines did not have clamps on them and blew off until fixed, so again there were some plumbing costs here. The biggest problem was lack of water pressure and the frustration trying to get the system to prime. It did not work real well at any time.

**c. Other Costs:**

The other costs were equipment and incidentals to make the week in week out slaughter happen. This list would include the following:

Rubber boots  
Rubber gloves  
Knives  
Coveralls  
Cleaning solutions  
Cleaning utensils  
Carcass Bags  
Hair nets, beard nets  
Hoses, nozzles  
Meat Hooks  
Rollers

Then there are all the costs often forgotten:

Insurance on the truck and Trailer  
Licenses,  
Meat Inspection costs  
Hotels  
Meals  
Over time  
Back up driver, workers  
Weather (Rain, cold etc)

**d. Some Budgets:**

On a full days kill these are the number of animals that could probably be slaughtered

And Hung in the cooler using a crew of three people plus an inspector.

Cattle: 10 Assuming cattle in the 1200-1600 pound range

Bison: 10 Assuming bison in the 900-1400 pound range

Pigs: 20-22 Assuming market hogs in the 230-260 pound range

Deer: 20-25 Assuming deer in the 100-150 pound range

Sheep: 35-40 Assuming market lambs in the 100-125 pound range

The costs for a full day kill of beef cattle would be something like this.

This is assuming a 1.5 hour (130 km) drive one way from a central point.

Labor Slaughter day	12 hours x 3 people x \$25/hour	\$900
Labor Unloading	2 hours x 2 people x \$25/hour	\$100
Inspector Cost		\$27
Cleaning	3 hours x 1 person x \$25/hour	\$75
Truck diesel fuel	260 km x \$.50/km	\$130
Truck maintenance	260 km x \$.50/km	\$130
Trailer Diesel (running 50 hours)	200 liters	\$180
Trailer maintenance		\$100
Propane	10 pounds	\$7
Misc (coveralls, boots, hair nets, etc)		\$30
Water (500 gallons potable water)		\$10
<b>Total cash costs</b>		<b>\$1689</b>

Payments: If the truck and trailer cost \$300,000 and the loan was at 8% over 10 years then annual payments would be about \$45,000. If a year had 50 slaughter days  
Then payment cost per slaughter day is \$1000.

Depreciation: The truck and trailer would probably have little value in 10 years.  
So a figure needs to be used for depreciation.

Insurance: Insurance depends on a lot of factors such as driving record history, experience of the driver. The minimum cost for one year will be around \$9,000 but realistically it will be closer to \$12,000 for the year. If the unit is only being used in the warm months (1/2 year) then \$6000/ season is in the ball park. Again if we assume 50 slaughter days per year then insurance will cost at least \$100/slaughter.

Registration: Registration and commercial plates cost about \$300/month, or \$3600/year so again at 50 slaughter days per year the registration costs are about \$72/ slaughter day

## **e. Temperatures:**

### **Temperatures**

How quickly a carcass cools and how quickly it gets moved out of the Abattoir will have a huge affect on costs. The larger and fatter the carcass, the longer it takes to cool. The Bison cooling graph clearly shows that a fatter carcass takes longer to cool. The picture on the bottom is a muscle cross section of a grass finished bison with little fat cover this represents the blue line on the graph. The top picture is a grain finished bison with a lot of fat cover; this represents the pink line on the graph.

In our case the carcasses were cooled to 4 degrees Celsius for all the carcasses except the beef that were done in Stettler. The beef in Stettler were transferred into another provincial plant so were allowed to be transferred the following morning. But all the other beef carcasses took approximately two days to cool before being unloaded. The following tables and graphs give a good picture of what happened in regard to temperature and unloading. The last graph gives a picture of what happened in the cooler and carcass for a typical slaughter day.

The blue line represents the cooler temperature. The cooler always was cool at first and as the day time temperature increased and the warm carcasses were put in, the temperature rose. As the carcasses started to cool toward evening, the temperature dropped rapidly and stayed around freezing.

The pink and yellow lines represent different sized carcasses hanging side by side and slaughtered on the same farm. The larger cow carcass (pink line) takes longer to cool than the smaller steer carcass (yellow line) simply because the cow carcass is much bigger.

This is clearly shown in the top table where smaller carcasses such as lamb cool down in 9 hours then the pigs and deer (bottom table) take 12 hours, then the pig takes about 24 hours and cattle around 48 hours to cool to 4 degrees Celsius.

### Spring 2009 on-Farm Slaughter

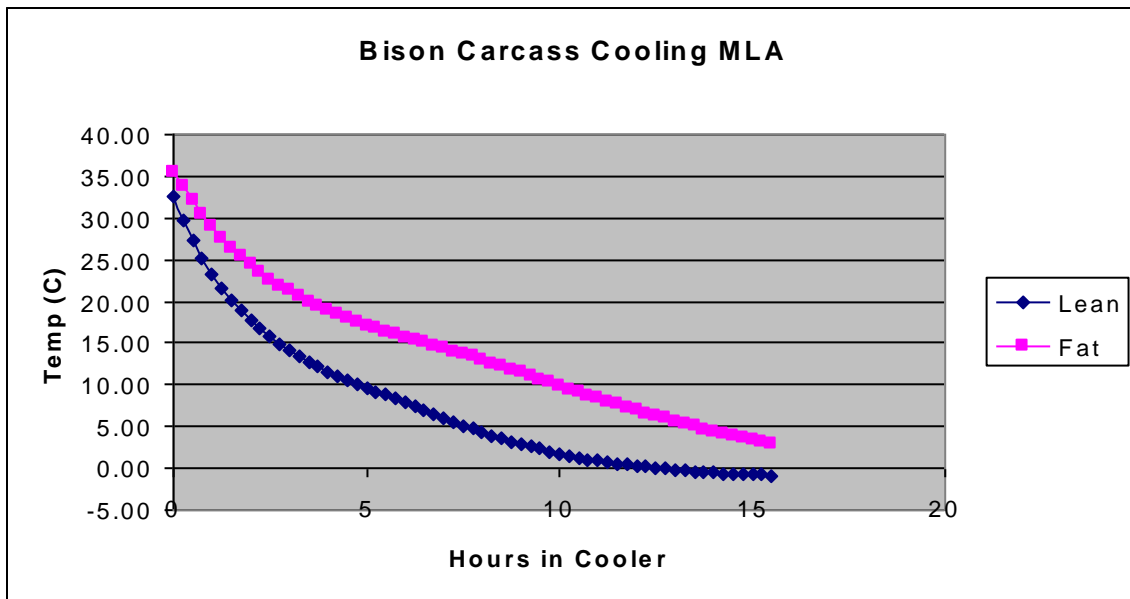
<b>Date</b>	<b>Place</b>	<b># Head</b>	<b>Species</b>	<b>Time to cool to 4°C</b>	<b>Unloading</b>
April 24	Olds	1	Average Cow	NA	Olds Meats
May 6	Olds	1	Large Cow	NA	Olds Meats
May 6	Olds	1	Pig	NA	Olds Meats
May 13	Warburg	2	Steer	46	Farm Meat Shop
May 13	Warburg	4	Pigs	24 Hours	Farm Meat Shop
May 20	Fort Macleod	6	Large Holstein Steer	43 Hours	Farm Meat Shop
May 27	Champion	22	Lambs	9 Hours	Farm Meat Shop
June 16	Rosemary	12	Market Hogs	21 Hours	Farm Meat Shop
June 18	Medicine Hat	3	Cows	33 Hours	Farm Meat Shop
June 18	Medicine Hat	3	Steers	24 Hours	Farm Meat Shop

### Stettler Swabbing Project

<b>Date</b>	<b># Lead</b>	<b>Cattle</b>	<b>Time to cool to 7°C</b>	<b>Unloading</b>
July 9	4	Steer	20 Hours	Provincial Plant
July 9	3	Cows (srm)	20 Hours	Provincial Plant
July 16	9	Steers	20 Hours	Provincial Plant
July 23	4	Steers	20 Hours	Provincial Plant
July 23	4	Cows	20 Hours	Provincial Plant
July 30	4	Steers	18 Hours	Provincial Plant
August 6	2	Cows	19 Hours	Provincial Plant
August 6	6	Heifers	18 Hours	Provincial Plant
August 6	1	Condemned		Provincial Plant
August 13	10	Large Cows	16 Hours	Provincial Plant
August 20	10	Beef	19 Hours	Provincial Plant

## Bison and Deer Project

Date	Place	# Lead	Species	Time to cool to 4°C	Unloading
September 23	Pigeon Lake	10	Lean grass finished Bison	20 Hours	Meat Shop
September 30	Athabasca	10	Fat grain fed Bison	22 Hours	Meat Shop
October 7	Vegreville	10	Older white tail Bucks	12 Hours	Provincial Plant
October 21	Airdrie	10	Larger grass fed Bison	26 Hours	Provincial Plant
October 28	Mayerthorpe	5	Large 4 year old grass fed Bison	28 Hours	Provincial Plant Meat Shop

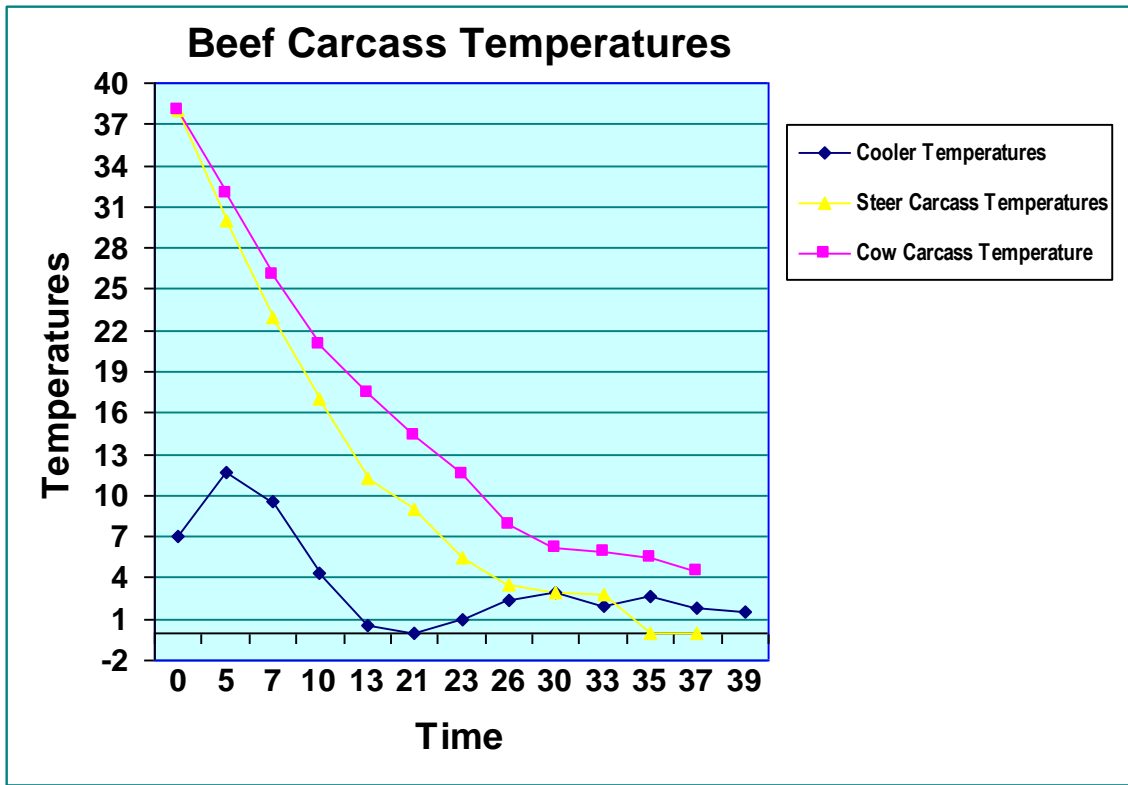




### Grain Fed Bison



### Grass Finished Bison



## 6. CONCLUSIONS

### a. The Good Bad and Ugly:

This was a very interesting trial and a wonderful learning experience. Some things went well some not so well.

#### ***The Good:***

The Abattoir did work. Not one planned kill was cancelled. Every animal presented was slaughtered. The cooling went well the main cooler had a lot of capacity. There was never a problem or weather that forced a cancellation.

The trailer as a structure was well built and traveled well. The generator worked well and there was enough fuel to run for at least 52 hours.

No one was hurt badly even though there were some pretty wild animals slaughtered. The slaughter was very sanitary and the swabbing results showed very little problems with micro organisms. The water never ran out and the waste was always handled adequately. The good is that it did work!!

#### ***The Bad:*** and recommendations

Even though it worked there were a lot of little things that were nagging problems or could turn out to be problems. One person definitely had to be mechanically inclined and a tool box was one of the first things purchased.

There were plumbing and electrical problems from the beginning. Pipes had been cut and had to be replaced. There was leaking and propane lines were not tightened. This was all corrected after a few kills and things went reasonable smooth.

The water pressure system never worked real well. It was hard to get good pressure. The pump often lost its prime and had to be re-primed. It was simply not a high quality system that should be used in an industrial situation.

The electrical problems were ongoing and getting worse as the summer progressed. There was a point where extension chords were run from the front outside the trailer and to the back just to keep things working. The electrical cable was too small and there simply were not enough outlets. This was finally fixed after an electrician spent a few days adding some more lines.

The plumbing and electrical were the biggest disappointments about the actual manufacturing of the trailer. It was as if these two areas were done by an amateur.

The trailer diesel tank had no site glass or any way to know how full it was. An old electrical cable was used as a sort of dipstick to check the level.

The water heater did not always work well and would often need fidgeting. It was worse in the fall when the heaters were also used. Two separate propane systems would have been better.

Cupboards and shelves should have been installed in the front room. There was often a lot of clutter because there was no place to store anything. The shower was never used and therefore became a storage area.

The fresh water tank (500 gallons) was just border line. 600-700 gallons would have been better. There were a few beef kills with dirty animals where there was no water left for cleaning.

The dirty water tanks under the trailer worked well but it was clear that the capacity was lower with each kill. They were filling up with solids and were impossible to clean. There should have been some openings opposite the drains so you could actually look inside and get a high pressure wand inside. Besides this, they worked well.

When the heaters were needed in the fall they did not work because of corrosion due to water spray. The thermostat needed to be water proof and the electrical should have been better protected.

The flooring was a good news/bad news thing. The flooring was good because it was not slippery and dangerous, but the problem was in the cleaning. Fat and hair built up on the rough surfaces and were hard to remove. Also many of the good chemicals were not compatible with aluminum. A different floor should have been used in the front because it was very hard to clean spraying against the floor grain.

Water from the front of the trailer would run under the walls and into the cooler. This is a concern because of sanitation and one wonders about rotting in areas where it cannot dry. Also there was leaking to the outside nearly every where around the trailer. This would be a real concern in cold weather. This is also a concern with regard to rotting under the walls; a person has to question the life expectancy of this trailer.

The trailer had 3 types of wall covering. The stainless steel in the cooler worked very well and stood up the best. The plastic in the second room also worked well.

The concern is with the painted steel in the last compartment. There was a lot of paint chipping and wear over the summer. There are large animals swinging with sharp hoofs. Plus there are steel hooks and knives being used as well as ladders and steel poles and crowded conditions. This means there is a lot of contact with the walls as a result of the scratching and eventually it will rust. Painted steel is NOT recommended.

The telescoping bars that were used for preventing carcasses from swinging and moving while in the cooler, did not work at all when traveling. We had to tie all the carcasses together using cargo straps that could be ratcheted tight. This worked well and we had no carcasses on the floor when tied together.

It was important to level the trailer at the slaughter site so the water did not pool in the corners and the drains worked properly. Leveling was done using planks under the trailer or tractor wheels. The tractor air bags could also be emptied which lowered the front of the trailer if necessary. Overall this worked well. One recommendation is to have hand valves on the trailer air bags that would allow the bags to be emptied. If each side had a separate valve it would be ideal.

The back "I beam" that pulled out was difficult to push back in with a carcass hanging on it. We used a twenty foot length of one inch galvanized pipe to push the "I beam" back in. The outside guy would push with the pipe while the inside guy held the carcass and helped push if necessary. Sometimes it took three pushing and pulling to get a large cow in.

The "I beam" worked better at the beginning but as the rollers and beam started to corrode and rust it became harder and harder. One recommendation would be to put an air cylinder on the "I beam" so it could be moved in and out with an air valve. This would give more control and prevent accidents.

The back winch on the "I beam" worked well but was very slow. A faster winch would probably save a half hour in time on a full days kill.

### **c. Final Conclusions**

This means one day of Slaughter will cost about \$3000. And no profit has been made and that a few things have to be in place to make an MLA system work:

- If a group or person can buy the unit inexpensive enough then payments go down
- If the MLA becomes part of an existing business or central cutting receiving facility then again some costs can come down. For example the insurance could be part of a truck fleet that already exists and becomes less expensive.
- If the unit can be plugged into the electrical grid then diesel costs will go down.
- High value livestock get slaughtered for a niche market where people will pay for this type of slaughter.
- The meat is much better because of low stress slaughter and consumers pay more for it.
- If the actual slaughter can be sped up by using a docking station with a faster hoist and good handling facilities, then some time can be saved.
- The one big factor is volume or number of animals put through in a year. As a commercial operator with high fixed costs the more animals that are put through and the more days slaughtering per year then the less it will cost per slaughter day.

People that are interested in purchasing the unit will need to do their own evaluation and assessment. The above report is simply a summary of what the operators of the MLA found testing the unit in Alberta in 2008.

## **APPENDIX A**

### **Field Testing the MLA in 2008:**

The MLA was field tested from April to November 2008. The MLA travelled and operated from north of Athabasca to Lethbridge, Medicine Hat and various points in between. The following is a quick diary of the various slaughter days and sequence of events throughout the summer of 2008. We had numerous problems with the electrical and plumbing systems throughout the summer. These were all dealt with by Olds College Staff from April to June.

April 24, Thursday: First Kill- Olds College

We tested the Abattoir on one average sized beef at Olds College. The animal was shot in a small pen and bled; it was hauled in a front end loader bucket to the abattoir. Every thing went okay and the animal was successfully inspected and hung in the cooler. This animal was unloaded into the cooler at the Olds College Provincial plant. Some additional electrical and plumbing problems showed up and it was felt that another test was necessary before we went to a farm.

Issues/Problems:

The leg chains we had assembled were too long, not strong enough, and just didn't work.

The cradle that had come with the trailer from Tri-Van was too narrow, so to skin the beef a leg had to be held up by the small electric winch, and the spitting system had to be reconfigured to allow proper splitting.

Hot water system- we had yet to figure out how to operate it. Turns out the propane heaters were not installed properly, so when the propane was turned on to the hot water heater, the valve on the tank would do a safety shut off because the valves on the heaters were wide open.

We learned: That the generator and coolers would run over night and beef will cool down at an average rate.

Offloading:

The beef was quartered, wrapped, and loaded into the blue plastic transport tub owned by Olds College. The beef was unloaded into the Olds College cooler.

May 6, Thursday: We tested a very large beef cow that weighed over 1800 pounds and one hog. We shot the cow in a small pen, bled into a large plastic container and transported the animal to the abattoir. The hog was stunned in a stock trailer, pulled out by hand, hung on the back I beam and bled outside into a bucket. Again every thing went smoothly and the animal was inspected and hung in the cooler. A few additional repairs had to take place but it was felt we could hit the road and give it a try.

May 13, Tuesday: We left Olds at 5 AM and headed to our first on farm slaughter west of Leduc near Warburg. We arrived at the farm close to 8 AM. We set up in a pasture just east of the farm yard with the back of the Abattoir facing straight East.

We slaughtered 2 steers and 4 pigs at this farm. All the animals were shot with a 22 rifle while confined in a squeeze about 100 meters from the MLA. After shooting the animal was hoisted up by a front end loader on a farm tractor then bled into a bucket and transported to the back of the abattoir. The two steers were slaughtered first then a thorough clean up took place before the 4 hogs were slaughtered. The day started at 9 am and was completed at 3 pm. We had some trouble getting the unit to cool properly. Most of this was due to the operators not totally understanding the cooling system. The batteries in the cooling timer were replaced and the unit worked well. But this meant at least a few hours lost cooling capacity. All of the heads, offal, hides and blood were deposited into a loader bucket and disposed off by the farmer.

We learned:

That the trailer should go the night before so that there is plenty of time to get set up, level, and the rest of the crew can arrive in the morning ready to work. That two species can be done in one day, the trailer just requires a good wash down of the inside before the second species begins. Dogs and other pets are to be locked up before slaughter begins.

May 14, Wednesday: The MLA was locked and left running on the farmer's property over night. The driver returned to the farm on Wed afternoon to check on the unit. The unit was cooling but not as quickly as expected. At the 3 pm the cooler was at 3.6 Celsius and the carcass internal was 13 Celsius. The thermostat was lowered and the unit left to cool.

May 15, Thursday: The driver and coordinator arrived mid morning. The beef carcasses were not quit cool enough and still at 6 Celsius. It was decided to wait till after lunch to unload the carcasses. All the carcasses were wrapped and loaded into a reefer truck that the farmer had. All the carcasses were delivered to a meat processing facility on the farm that was approved by Capital Health.

The waste water was unloaded and spread on a pasture on the farm and the unit was driven back to Olds. The unit was totally washed and cleaned the next day.

May 19, Monday: The MLA was picked up and driven to Lethbridge and parked over night.

May 20, Tuesday: The unit was driven to a feedlot south of Fort Macleod where we arrived at 7AM. We found a reasonable site to park the unit near the feed lot. Because it was not on a pasture there was more mud to deal with and this was not ideal. The beef animals were put one at a time into a small pen about 6 feet by 16 feet. This was not ideal because the animals were very uneasy and did not stand still very long. It did take more time to get an adequate shot.

6 head of cattle were slaughtered. The day started at 9 AM and the slaughter was finished at 4 PM. Most of the cattle were Holstein steers with the largest being over 1800 pounds.

There were also two that were very crippled. Four of the animals were older than 30 months (OTM) which meant a lot of extra work and time to remove the spinal column. This was a good test because we had poorer, leaner non typical cattle that were also very large. The unit worked fine but it was a frustrating day with extra work and time. The larger animals did touch the Abattoir floor with their neck and had to be tied up and trimmed. It was clear that an 1800 pound tall long animal is too large for the Abattoir.

#### Issues/Problems

The producer was not ready to start when we arrived.

The site checklist had not been completed, and so the producer was not aware of our expectations and needs.

-animals were not gathered up into one pen.

-they planned on stunning in a very wet and dirty large alleyway.

-the tractor was not available solely for the MLA use, which caused some time issues, we could have been more efficient slaughtering and got more animals done but did not have a way to move guts or animals.

We learned:

The Site checklist is to be forwarded/faxed/mailed to producer, discussed and signed prior to any slaughter activity.

How to take the backbone out of cattle, we had lots of practice as four of the animals were over thirty months old, so the back bone was taken out using the saw.



The unit was cleaned by 5:30 and the MLA with the carcasses secured was driven to Lethbridge and parked with the generator left running. After the short (1 hour) trip the carcasses had broken free from the bars that held them in place and had moved all over the place. The carcasses were evenly distributed and left to cool. The carcasses were down to 19 Celsius by 9 pm.

May 21, Wednesday: The unit was left running with the carcasses cooling well. It was a warm sunny day which did slow the cooling down some what.

May 22, Thursday: The unit was driven back to Fort McLeod and arrived back at the feedlot at 11:30. The feedlot had their own meat shop that was approved by the health unit. The unloading went smoothly and took about 1.5 hours. The unit was driven back to Olds and parked to be washed the next day.

May 26, Monday: The unit was picked up in Olds and driven to Champion and parked overnight at a sheep farm west of Champion.

May 27, Tuesday: The rest of the crew arrived at 8 Am and the first Lamb was stunned by 9AM. We slaughtered 22 lambs and were finished the slaughter by 12:30 PM.

The lambs were around 125 lbs and were not sheared. The lambs were all in a stock trailer which was parked under a roof about 50 meters from the Abattoir. The back of the Abattoir was facing east. A electric stunner the same as used for hogs was used to stun the sheep. Some water was first thrown on the Lambs head and then stunned as soon as possible. The lamb was then physically hauled out of the trailer and a chain was immediately attached and then the lamb lifted up by a front end loader. The lamb was then bled and left to hang till bled out. Then the lamb was brought to the back of the abattoir and hoisted inside.

#### Issues/Problems

The lambs were all in one trailer, in one pen. This presented a challenge as it required two people to stun and bleed the lambs, taking one person out of the Abattoir.

#### We learned

Need to be more specific about the handling requirements for stunning, or more staff gets tied up outside.

The lamb day went smooth and the crew was gone by 2:30 pm. The carcasses were left to cool and were down to 4 Celsius by 9:30 pm. The Carcasses were unloaded right into a cooler on the farm and were unloaded by 10:30 pm. Because the lamb carcasses were so light it was very easy to manhandle and lift with one person. And because the carcasses are not split the whole slaughter went pretty smooth.

May 28, Wednesday: The unit was driven back to Olds and it was cleaned and washed the next day.

June 15, Sunday: The unit was driven to Rosemary (Near Brooks) and parked over night.

This week was to test the logistics of booking and carrying out two slaughters in two different locations in the same week. The second kill of the week was June 19.

June 16, Monday: We slaughtered 12 market weight hogs near Rosemary. These hogs were all outdoor raised and a good size. The kill was finished by 12:30 and cleanup was done by 3 pm. The trailer was washed very clean as we could not return to Olds to clean.

June 17, Tuesday: The hogs were down to 4 Celsius by 9 AM. The unit was driven to Rosemary and the hogs were unloaded at a meat shop in town. The trailer was filled with potable water in Rosemary and then driven to Lethbridge and parked over night.

June 18, Wednesday: The unit was driven to a ranch north of Medicine Hat and parked in the ranchers pasture over night. The rest of the crew arrived from Olds that evening.

June 19, Thursday: We slaughtered 6 head of beef cattle (3 cows and 3 steers) and were finished by 12:30 pm. Things went very smooth. The kill was done on a pasture which meant every thing stayed much cleaner.

June 20, Friday: The unit continued to cool well all day even though the weather was hot.

The carcasses were cool by 9:30 pm and unloaded into a meat shop at the ranch.

June 21, Saturday: The unit was driven back to Olds where it was parked and cleaned up the next week.

July 8, Tuesday: The unit was picked up at Olds and driven to Stettler. The unit is parked at a provincial plant and will remain in Stettler for 7 weeks. This is a separate project where we will slaughter a minimum of 50 beef cattle and do a swab of each carcass before unloading. The swabs were delivered to a lab in Edmonton where analysis was done for microorganisms. The purpose of this project is to simply examine whether a mobile slaughter plant can indeed produce clean meat from a microbial perspective. This completed study is attached as an appendix.

Every Wednesday for seven weeks, beef cattle were slaughtered. The cattle were taken from a pen inside the provincial plant and held in a squeeze which was attached to the loading chute. The cattle were slaughtered using a captive bolt pistol using 22 blanks.

The cattle were bled into a plastic tray in front of the squeeze and then hoisted up using the MLA hoist. Overall it went pretty smooth. The unit was washed every Thursday after the carcasses were unloaded. Using the high pressure system with hot water from the plant made cleaning much easier and more thorough.

We slaughtered young well finished cattle, old, thin, cows, bulls and anything in between. There was a lot of variation. A total of 57 head were slaughtered. Some days, 10 were slaughtered and one day only 4.

August 21, Thursday: The unit was driven back to Olds and parked.

September 23, Tuesday: The unit was driven from Olds to Pigeon Lake. This was our first Bison Slaughter in conjunction with Lacombe Research station. The project involved killing 15 Bison on each farm. The first 5 bison were slaughtered at the research station after being trucked. The other 10 are slaughtered on the farm using the MLA. Of the 10 slaughtered on the farm 5 were slaughtered in the squeeze and the other 5 in a pen.

We successfully slaughtered 10 bison. The unit worked well and we were finished by 3 PM and then did a clean up. The unit was left running overnight on the farm as the carcasses cooled.

September 24, Wednesday: The Lacombe team took carcass samples and monitored temperatures.

September 25, Thursday: The unit was picked up at the farm and driven to a meat shop in Thorsby where the carcasses were unloaded. The carcasses were cool enough the previous afternoon, but were not able to be unloaded till the next morning. The unit was driven back to Olds and cleaned the next day.

September 26, Friday: The cleaned unit was picked up in Olds and driven to Barrhead and parked for the weekend.

September 30, Tuesday: The unit was driven to a Bison farm NW of Athabasca. The slaughter started at 8a.m. and the day went smoothly. The bison were all in the cooler by 2 p.m. and the cleanup was finished by 4 p.m. The unit was left running on the farm over night. The unit was parked in a pasture with thick grass which helped keep things much cleaner.

October 1, Wednesday: The Lacombe crew met at the unit at 8:30 a.m. and took the samples needed. The carcasses were tied together and the unit was on the road by 10:30 a.m. This was the longest trip with the carcasses still in the cooler. The unit was driven to Spruce Grove and arrived at 1 p.m. The carcasses were just down to 4 Celsius by 1p.m. The unloading went smoothly and the unit was on the road by 2:30 p.m. The unit was driven back to Olds and parked. The next day it was cleaned and made ready for the next slaughter.

October 6, Monday: The unit was picked up in Olds and driven to Vegreville and parked over night.

October 7, Tuesday: The unit arrived at a whitetail deer farm just west of Vegreville at 7:30AM. The slaughter started just after 8 and went smoothly. 10 older whitetail bucks were slaughtered and were finished just after 12. The bucks were held in a special squeeze where the floor dropped out. They were shot with a 22 right behind the ear as a front head shot was not possible. The unit was washed thoroughly and was on the road by 3:30 PM. The deer were tied up and secured and driven to Rimbey where the unit was parked over night.

October 8: Wednesday: The carcasses were cool enough well before 6 a.m. when the unit left Rimbey. The unit was driven to a Provincial Plant near Penhold and the carcasses were unloaded by 9 a.m. The unit was driven back to Olds where it was cleaned and made ready for the next slaughter.

October 21, Tuesday: The unit was driven to a Bison farm west of Airdrie and parked in a pasture near the corrals. The day went smoothly and 10 bison were slaughtered by 3 p.m.  
The unit was cleaned out and the unit driven back to Olds with the bison hanging in the cooler. The unit was parked at Olds College and left running.

October 22, Wednesday: The unit was left running and cooled well.

October 23, Thursday: The unit was picked up at Olds at 11 a.m. and driven to Innisfail to be unloaded. The unloading started at 1:30 and took about one hour. The unit was driven back to Olds to be cleaned for the next slaughter.

October 27, Monday: The unit was picked up in Olds and driven to Barrhead and parked over night.

Oct 28, Tuesday: The unit was driven to a Bison farm near Mayerthorpe. This is the last day and only 5 bison are slaughtered. These were older (4 year olds) and larger bison and the 300 magnum rifle was used. The day went smoothly and the slaughter was finished around noon.

The night before the temperature dropped to -5 Celsius and the water lines in the trailer were frozen. It took approx. a half hour with the heat on to get things going but they eventually thawed and slaughter started by 9:30.

The bison were secured and the unit was driven and parked at Barrhead for the cooling.

Oct 29, Wednesday: The Lacombe crew came at 8 a.m. to take their samples and the other crew did their swabbing. The unit was left running and cooling during the day.

The carcasses were cool enough to unload in the evening.

Oct 30, Thursday: The unit was unloaded at a provincial plant in Barrhead. This went smoothly. One carcass was left in the cooler and taken to Olds to be unloaded.

This last carcass was transferred to another truck in Olds and taken to Longview and unloaded there. The unit was cleaned in Olds and was parked for the winter.

## APPENDIX B

### Multi-Location Abattoir Summary of Operating Calculations

<u>Year 1</u>	<u>Annual cost</u>	<u>Cost per production run</u>	<u>Cost per beef/bison</u>	<u>Cost per hog/deer</u>	<u>Cost per lamb</u>
Labour	61,812.50	1,236.25	123.63	61.81	35.32
Inspection	1,450.00	29.00	2.90	1.45	0.83
Maintenance	11,500.00	230.00	23.00	11.50	6.57
Fuel	9,130.00	182.60	18.26	9.13	5.22
Supplies	1,500.00	30.00	3.00	1.50	0.86
Propane	350.00	7.00	0.70	0.35	0.20
Water	500.00	10.00	1.00	0.50	0.29
Laundry	1,250.00	25.00	2.50	1.25	0.71
Insurance	13,000.00	260.00	26.00	13.00	7.43
Registration	3,600.00	72.00	7.20	3.60	2.06
Office staff	3,000.00	60.00	6.00	3.00	1.71
Office supplies	500.00	10.00	1.00	0.50	0.29
Communications	2,400.00	48.00	4.80	2.40	1.37
Banking costs	300.00	6.00	0.60	0.30	0.17
Professional fees	2,000.00	40.00	4.00	2.00	1.14
Advertising and promotion	1,000.00	20.00	2.00	1.00	0.57
Debt servicing	29,118.62	582.37	58.24	29.12	16.64
<b>TOTAL</b>	<b>\$142,411.12</b>	<b>\$2,848.22</b>	<b>\$284.82</b>	<b>\$142.41</b>	<b>\$81.38</b>
Depreciation	30,000.00	600.00	60.00	30.00	17.14
<b>Total Allocated Costs</b>	<b>\$172,411.12</b>	<b>\$3,448.22</b>	<b>\$344.82</b>	<b>\$172.41</b>	<b>\$98.52</b>

Total beef or bison annually	500	10/production run
Total hogs or deer annually	1000	20/production run
Total lambs annually	1750	35/production run

Total capital cost	\$300,000
Initial equity	\$100,000
Original debt amount	\$200,000

<u>Revenue Requirements</u>	<u>Annually</u>	<u>Per production run</u>	<u>Per Beef/Bison</u>	<u>Per Hog/Deer</u>	<u>Per lamb</u>
required return on assets					
10.00%	\$202,411.12	\$4,048.22	\$404.82	\$202.41	\$115.66
15.00%	\$217,411.12	\$4,348.22	\$434.82	\$217.41	\$124.23
20.00%	\$232,411.12	\$4,648.22	\$464.82	\$232.41	\$132.81

## Multi-Location Abattoir Input Sheet

Truck/trailer cost	\$300,000	Total capital cost to enter business, includes required tools
Equity investment	\$100,000	Portion of total that is contributed by business owner
Capital asset loan	\$200,000	Portion of total financed by lender
# of production runs	50	
Average km travelled	260	per production run (return)

### Labour

Assume that there are a total of 3 staff and job duties are divided here to allocate cost/job function

# of production staff	3	
Wage rate (\$/hr)	\$25.00	per hour
Hours	12	per production run
# of carcass unloading staff	2	
Wage rate	\$25.00	per hour
Hours	2	per production run
# of cleaning staff	1	
Wage rate	\$25.00	per hour
Hours	3	per production run
EI, CPP, WCB, etc.	15%	percentage
Annual wage increase	1%	percentage

### Overhead

Provincial meat inspection	\$4.00	per hour (assumed that no overtime is charged)
Hours	7.25	per production run
Truck maintenance	\$0.50	per km
Trailer maintenance	\$100	per production run
Truck fuel	\$0.50	per km
Trailer fuel for cooling	\$0.90	per litre (200 litres to fill tank and run 50 hours per production run)
Supplies for production	\$30	per production run (coveralls, boots, knives, aprons, etc)
Propane	\$0.70	per pound (10 pounds per production run)
Water	\$10	per production run (require 500 gallons potable water)
Laundry	\$25	per production run
Truck/trailer insurance	\$8,000	annually
Truck/trailer registration	\$3,600	annually
Commercial business ins.	\$5,000	annually

# of office staff	1	
Wage	\$15.00	per hour
Hours	4	per production run (scheduling, payroll, invoicing, collection)
Office supplies	\$500	annually
Communications	\$2,400	telephone/cell phones/internet/fax
Banking costs	\$300	annually
Professional fees	\$2,000	annually (prepare year end financial statement)
Advertising and promotion	\$1,000	annually
Interest rate	8%	on capital asset loan
Period of loan	10	years
Monthly loan payment	\$2,426.55	
Useful life of plant	10	years
Depreciation rate	10.00%	percentage
Depreciation method	straight	

This excel spreadsheet was developed by Cody Cunningham at Alberta Agriculture in Red deer. An actual working copy of the excel spreadsheet Can be sent to you by contacting Bert Dening at 780 674 8246 or E-mail Bert at [Bert.dening@gov.ab.ca](mailto:Bert.dening@gov.ab.ca).



## **APPEDIX C**

This microbial baseline study is the results of the 57 head of beef cattle slaughtered in Stettler in the summer of 2008.

The document is a stand alone document and any of the authors can be contacted for more information.