

**Nova Scotia Agricultural College
Undergraduate 4th Year Project**

**Restrictions, Needs, Markets and Opportunities Associated with
a Mobile Slaughter Facility in Nova Scotia**

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2005**

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Glossary of Terms

Abattoir - Facility for slaughtering animals

Canadian Food Inspection Agency (CFIA) - Agency that provides abattoirs with federal meat inspectors and certification.

Dark, Firm and Dry (DFD) - Arises when there is a depletion of the animal's energy store, glycogen in the muscle, resulting in dark, firm and dry meat. This condition is not relative to genetics, happening in beef and swine. Usually a good indicator of poor handling pre-slaughter.

Farm-Gate Producer - Sells meat or dairy products processed on their farm in a non-inspected environment, directly to the consumer.

Federal Inspection - The Canadian federal inspection system allows meat processed in federal facilities to be sold within the province, interprovincially, or internationally. In Nova Scotia there are only four federally inspected slaughter facilities, none of which service beef.

Mobile Slaughter Unit (MSU) - A slaughter service that is carried out on the farm of the customer. The unit travels to the farm, with animals generally killed outside of the unit. They are then eviscerated, trimmed and hung to cool until moved to a fixed cooler until processing. This slaughter service is generally inspected.

Multi-Location Abattoir (MLA) - A slaughter service that is carried out on-farm by a licenced butcher. This service is generally for downed or injured animals that would otherwise be inhumane to transport. This service is uninspected, therefore meat processed by MLAs are for personal consumption of the customer and their immediate family only. Uninspected carcasses are taken to be processed in Public Health Facilities before returned to the farmer.

Niche - A product that is aimed at a narrowly defined group of potential consumers.

Nova Scotia Department of Agriculture and Fisheries (NSDAF) - The agency that provides abattoirs with Provincial meat inspectors and certification.

Offal - The viscera and trimmings of an animal post-slaughter, often considered inedible by humans.

Pale Soft and Exudative (PSE) - Arises when there is an increased breakdown of the energy store, glycogen in swine. This condition decreases the value of the meat, and can either be related to the genetics of the pig, or as an indicator of poor handling prior to slaughter.

Prions - An unconventional transmissible agent found in the Specified Risk material (SRM) of ruminants believed to be the cause of BSE, a progressive neurological disorder in cattle

Processing - Preparation of meat for human consumption, through various meat cuts, or products as ground meat and sausages.

Provincial Inspection - A Canadian inspection system that allows for meat processed in Provincially inspected facilities to be sold within the province. Meat from these facilities can not be sold internationally or interprovincially. In Nova Scotia, there are twenty-one provincially inspected abattoirs, and are inspected by inspectors from the Nova Scotia Department of Agriculture and Fisheries.

Slaughter - The killing of animals for food purposes.

Specified Risk Material (SRM) - SRM are tissues that, in BSE (Mad Cow) related cattle, have been shown to contain the infective prions that spread the disease. SRM includes the skull, trigeminal ganglia (clusters of nerve cells connected to the brain and closely apposed to the exterior of the skull), eyes, tonsils, spinal cord and dorsal root ganglia (clusters of nerve cells connected to the spinal cord and closely apposed to the vertebral column).

Traceable - Ability to trace the history, application or location of an item or activity by means of recorded identification. In the meat industry, it allows for trace-back of products or animals through the supply chain in the event of a food safety problem as well as providing food safety and quality assurance to customers.

Executive Summary

The overall objective of this project is to discover restrictions, guidelines, needs, markets and applications for a multi-species mobile slaughter facility in Nova Scotia. Throughout the project, some main questions will be:

- Are sufficient slaughter and processing services available for livestock producers in Nova Scotia? Where may there be opportunities within the province and the industry?
- Could Nova Scotia accommodate a Federally or Provincially inspected, multi-species MSU? If so, what are the inspection requirements necessary for operation?
- What mobile slaughter units exist elsewhere? What do they process? What is their capacity? Who were their investors and what was involved with the start-up costs?
- What are the various markets that could support a mobile slaughter facility? Could these facilities be an “added-value” service suitable for specialty niche markets such as organic, grass-fed, heritage breeds, free-range)?

- From an animal welfare perspective, what are the benefits to on-farm slaughter? Could it result in low pre-slaughter stress? Would this have an impact on the quality of the meat?

Research was carried out in a number of ways. Contacts with the Canadian Food Inspection Agency, Nova Scotia Provincial Meat Inspectors, agricultural representatives from different provinces in Canada, as well as contacts from the United States where inspected mobile slaughter facilities are in existence were contacted. An overview of the meat processing industry in Nova Scotia was attained by a survey distributed to the twenty-one provincial abattoirs in the province. From this, an accessible directory was produced, including the various services the provincial abattoirs offer, so livestock producers may be able to choose a facility that most suits their needs. This survey also helped to gain a perspective of areas in the province where slaughtering services are lacking, what the needs and wants of livestock producers are, and where are areas in the industry that could be improved.

Conclusions and Recommendations

Provincial regulations allow for a mobile facility to gain provincial inspection. However, a MSU would not be eligible for federal inspection as of yet. The Canadian Food Inspection Agency has not yet made changes to the regulations allowing mobile slaughter. Although federal regulation of mobile slaughter facilities is in the works, it is a lengthy process that can still take a number of years to change (Gacek, 2005).

Livestock producers in Nova Scotia have expressed interest in mobile slaughter, especially organic and specialty producers. Many of these livestock producers considered mobile slaughter as a humane alternative of slaughter for their specialty meat products, but dismissed the idea for two main reasons: the initial start-up costs and the lack of adequate processing and holding capacity. Such units as the San Juan Island MSU in Washington State, had grants to help fund their initial start-up costs until the co-op was up and running (Gregory, 2005a). For Nova Scotia farmers, operating a MSU would be a somewhat private venture, so government funding may be difficult to acquire, having to pay the majority of the initial costs right from their pocket. A couple of the livestock producers also stated that they would not be interested in owning and operating their own mobile slaughter facility, but would rather have services available to them provided by someone else.

Currently in Nova Scotia, there is no training available to those interested in perusing a career in abattoir or retail meat cutting. For those interested, the only training they can acquire is on the job. With worries of many abattoir operators approaching retirement and no trained personnel to fill the positions, Nova Scotia may have to address the training issue to prevent many abattoirs from closing.

Nova Scotia has twenty operating, provincially inspected abattoirs in the province, with some geographic areas overlooked when it comes to slaughtering services. When speaking with abattoir operators and livestock producers, both stated that the southern shore of Nova Scotia, past Shelburne and around Yarmouth, is an area that does not have any attention for slaughtering

services. It was also commented by an abattoir owner that there should be more available slaughtering services between Truro and Cape Breton, because within that distance, there are only three abattoirs available, making everyone in between very busy.

The benefits associated with a MSU , such as a more humane, on-farm slaughter service, could present more opportunities for livestock producers. They could develop a higher cost as a result and capture premium markets for their products.

The amount of cold storage available for the MSU is a limiting issue in order to operate. Separate, fixed structures for the purpose of cold storage would have to be constructed, which could either be rented out when needed, or actually built on the farms using the mobile slaughter service, increasing the capacity of the unit.

A MSU may be suitable for poultry production. Considering the small carcass size, small amount of waste produced, and ease of handling, it may be reasonable to operate a mobile poultry processing unit. This way, many more carcasses could be hung at a time, the unit would not have to be as large, in turn, not as expensive to initially start as larger, red meat facilities. This would be especially helpful with the fear of the avian flu in Canada. Slaughtering poultry on-farm would keep the process completely closed to outside elements and reduce the risk of an outbreak.

Provincial abattoirs are stating that there is not enough demand to justify becoming a certified organic processing facility, yet at the same time, certified organic and specialty livestock

producers state that the services are scarce. Although many of the organic producers either can not afford a MSU or are not interested in operating one themselves, if the demand for sufficient services because too great, mobile slaughter could still be a solution. Starting a co-operative of provincial organic livestock producers to share in the operation and expenses could prove to be an economical alternative to transporting livestock to abattoirs, or operating a MSU on their own.

Another option that Nova Scotia could look into is adopting the “multi-location” abattoirs like the units in Alberta, where the butcher is licenced to slaughter animals on-farm and take them back to a facility to have them processed and packaged for the farmer. The drawback to this system is that is it not provincially inspected, and meat processed this way could only be consumed by the farmer and their immediate family. This option would not be a retail venture, however, it would be an excellent alternative for Nova Scotia livestock producers who have downed animals on their farm that are not able to be humanely transported to an abattoir.

Downed animals are able to be consumed, but consequently, does not yield a high quality of meat as an animal that was in a healthier state prior to death. There are many reasons that an animal would be classified as downed, and the reason for being “downed” will reflect the extent of the quality of the meat. Downed livestock could pose a threat to human health when circulated into the food chain, as some of the diseases that plague the animals affected could also be passed onto the humans consuming the meat (Farm Sanctuary, 2001). A facility as this may also be suitable for processing game species, as farm-raised deer which are known to be flighty and difficult to transport, being an excellent alternative for these animals.

Another idea that would have the same intention as a mobile slaughter facility, is to strategically place smaller, provincially inspected abattoirs in locations where they are most demanded. As mentioned, there is an opportunity for slaughter facilities along the south shore, and from Truro to Cape Breton. Placing small units in places as these would be more convenient than traveling farther to have the animals processed, and could be a cheaper alternative to starting a mobile slaughter facility.

Section 1 - Introduction to Mobile Slaughter

1.1) Background and Rationale

This project was undertaken to attempt to answer many compelling questions associated with the questions of a multi-species, mobile slaughter operation in Nova Scotia. Reasons for asking these questions include the industry's concern over availability of federally inspected processing facilities in Nova Scotia, (especially for beef) and the lack of access to provincially inspected facilities (especially in remote areas of the province and for specialty livestock such as organic or grass fed). Other issues leading to interest in mobile slaughter include an increasing public awareness about food safety, the desire for more traceable meat products in the instance of a disease or contamination outbreak, a growing concern for animal welfare, as well as reducing transportation of animals destined for slaughter. All of these factors have sparked an increased interest in production systems, including organic, grass-fed, and natural, which all attempt to increase the consumer value of the meat, as well as help to aid the challenges associated with meat production.

1.2) History of Mobile Slaughter

The diminishing number of local abattoirs in rural areas is making it increasingly difficult for meat producers to survive (Jannasch, et al, 2002). As a result of this, the concept of mobile slaughter has been in North America for over a decade as a creative solution to address industry demands.

The concept of mobile slaughter has been considered by a number of people for over a decade. One of the first ideas can be traced back to Kerrville, Texas over ten years ago, where under the supervision of Texas state inspectors, game species were processed in a MSU.(Pitts, 2005) There is no federal law governing the inspection of slaughtered game species, therefore meat produced in this unit was able to be sold anywhere in the United States.

The concept resurfaced in 1997 at Eagle Butte, South Dakota, where the Cheyenne River Sioux Tribe received a government grant to purchase a MSU, designed to let tribal members efficiently slaughter bison in a more "traditional" manner (Cournoyer, 1999). This facility was constructed by a company overseas known as All Terrain Logistics, (ATL), a company out of Bury St. Edmunds in Suffolk, England, who are specialists in servicing remote communities with fully integrated meat processing systems (All Terrain Logistics, 2004*b*). Before the \$1.5 million MSU, the bison were worked like cattle pre-slaughter, which was more stressful to the animals (Pitts, 2005). This MSU was used as a tool to re-establish healthy buffalo populations on South Dakota reservations (All Terrain Logistics, 2004*a*). This is not a federally inspected facility for the same reason as the Kerrville, Texas unit, bison are not required to be slaughtered in a federally

inspected plant, although it is seeking USDA approval (Hyde, et al. 2002). From this facility came the brainstorm for the first United States Department of Agriculture (USDA) inspected MSU.

Bruce Dunlop, a lamb producer, and one of the founding members of the Island Grown Farm Co-operative in Lopez Island, Washington State, took the idea of a MSU to another level. He saw that small farmers who wanted to market their livestock directly to consumers, restaurants and local stores did not have USDA inspected processing facilities available within a reasonable distance (Dunlop, 2005 *a*). He studied the unit of the Sioux Tribe in South Dakota, with an idea of designing a USDA inspected MSU able to accommodate beef, sheep, pigs and goats (Pitts, 2005), and on May 11th, 2002, the first USDA inspected MSU was opened (Kivisto, 2002).

Bruce Dunlop, the project manager for the facility, states this multi-species operation was developed for two main reasons; the lack of available facilities (abattoirs) for farmers to utilize, and the need for a process to eliminate the transportation of animals (Farmcentre, 2002). In this unit, it is possible to operate for two days before having to unload the carcasses and re-supply, processing five beef, twelve hogs, or twenty sheep per day with one butcher. It is also possible to increase capacity to nine beef in one day with a second butcher assisting (Gregory, 2005*b*). The unit is a 38 foot long gooseneck trailer, with 11 feet of clearance from ceiling to floor, and 8 1/5 feet wide (Farmcenter, 2002). The interior is lined with stainless steel, with checker-plate flooring for traction, and sanitation. A water tank accompanies the unit, as well as a hot water heater, and a diesel generator to power the whole operation.

Figure 1.1
The San Juan Island MSU in Washington State



For the San Juan MSU, animals are stunned and "bled-out" outside of the unit. After the animal has successfully bled, a 2.5% acetic acid is sprayed onto the carcass as it is moved inside,

Figure 1.2
Another View of the San Juan MSU



preventing the number of flies coming in contact with the hide (San Juan animal is in the unit, the and the feet are removed,

flies coming in contact (San Juan Movie, 2002). Once the skinning begins. The head then the carcass is

extensively trimmed of any visible contamination. The animal is then split into quarters, hung in the cooler, and inspected again for any contamination. After the carcasses have hung and cooled for two days, the meat will be moved to a separate operation where it will be cut, wrapped, and prepared to be sold. The MSU is not responsible for disposal of offal, putting the responsibility on the farmer. Farmers who use the mobile slaughter services compost the offal and return the

compost to their land when it is ready, therefore producing no wastes (Dunlop, 2005b)

Overseas, another interesting design exists for a mobile slaughter facility that is considerably larger than the three previously mentioned. This exists in London, England and is known as the SANMO multi-species mobile slaughter house, constructed on a two or three axle semi-trailer with adjustable air suspension. This design was previously mentioned as the design of the MSU for the Cheyenne River Sioux Tribe, South Dakota. The operating space inside the unit is 62.33 feet long, 27.39 feet wide and 21.65 feet of clearance (All Terrain Logistics, 2004c). This increase in space allows for more people to be utilized, in turn allowing more animals to be processed. When the unit is operating with eight fully trained staff, the SANMO mobile slaughter facility can process up to forty large cattle or buffalo during an eight-hour shift (All Terrain Logistics, 2004b) This unit is designed to process all types of game, up to a maximum weight of 1200 kg, from sheep to buffalo (All Terrain Logistics, 2004b) Many compartments in the trailer can be hydraulically extended out to allow for more room for refrigeration or office space. With the increase in capacity and size of the unit, the price if also going to increase.



Figure 1.3
Carcasses Hanging in the San Juan Unit

Just to offer an idea of the expense of these unique facilities, the Cheyenne River Sioux Tribe facility cost 1.5 million dollars to construct, being funded by government grants. These facilities would be suitable for serious, large-scale mobile slaughter of animals, considering the large price involved with such a unit.



Figure 1.4
SANMO MSU in Europe Before Hydraulic Extensions



Figure 1.5
SANMO MSU After Hydraulic Extensions are Opened



Figure 1.6
A Look Inside the SANMO MSU



Figure 1.7
Eviscerating a Cow in the SANMO MSU

1.3) Mobile Slaughter in Canada

Throughout Canada, the mobile slaughter concept is slowly gaining notice. In Alberta, there are just over one hundred registered, uninspected operating MSUs (Best, 2005). These MSU's are not like the unit in Washington, rather it is a butcher licenced to slaughter animals on-farm (Loback, 2005). Agriculture Alberta issues the licences for these mobile butchers, but does not so on the site of the farm to inspect the meat. That is the job of the butcher, who approves the meat it when the carcass is cleaned. These facilities go to the farm and generally process one or two animals at a time, mainly for farmers who wish to slaughter culls, or animals with injuries that would otherwise be inhumane to transport. After the animals are killed with the head, feet, tail and skin removed, the carcass is stamped by the butcher as "uninspected, not for sale" (Best, 2005). The carcasses are then transported to a public health processing facility, which is a provincially inspected facility that processes the meat at the farmer's request, usually as sausage or ground beef if it is a cull animal. Although the facility where the meat is processed is a

provincial facility, the meat is not able to be retailed as the manner and environment that the animal was slaughtered in was not approved by the province (Loback, 2005). Many mobile butchers own their own public health processing facility and will do the processing themselves (Loback, 2005). The meat is packaged (usually in the traditional brown paper wrap) and goes back to the farmer for him / her to use only for themselves and their immediate family, as the meat is unable to be sold because it is an uninspected product (Best, 2005).

Mobile slaughter is an important service in Alberta as the fifty-four provincially inspected abattoirs in the province are extremely busy resulting from the mad cow crises (Best, 2005). If a farmer needed a cow slaughtered right away as a result of an injury, the animal would not be able to survive until there was an availability in the abattoir. Having the mobile butcher allows the animals to be humanely slaughtered without enduring transport. Although these are not the same type of MSU as the San Juan Island Unit, it serves the same purpose, eliminating transportation allowing for a more humane slaughter service.

In the spring of 2005, a MSU was scheduled to open in the Abibiti region of Quebec. This facility is intended to process small-carcass beef, pigs, sheep, farmed deer and caribou (Morrigan, 2005*b*). At this time, there is little known about the MSU in the Abibiti region, only their intended opening in the spring.

Currently in Nova Scotia, neither a mobile butcher service or a MSU are in existence, but there is interest. Many organic farmers have considered this service in hopes of adding value to their

specialty meat products, as well as offering a humane slaughter alternative which is important in organic practices. One of the largest beef producers of the province has also had many ideas of a MSU, but no construction as of yet. However, he currently operates a mobile meat retail operation which services eastern, central and northern Nova Scotia , offering grass-fed beef direct to the consumers.

Section 2 - Alternative Marketing Opportunities Related to Mobile Slaughter

2.1) Specialty Markets

Consumer demand is increasing for specialty meat products including organic, heritage breeds, grass-fed, natural, hormone-free and humanely raised (Morrigan, 2005*b*). With these meat systems, animals are raised in the most natural, chemical and stress-free environment possible, following a set of guidelines for certification. This extra care should not be overlooked when it is time to slaughter the animal. Taking particular care before and during the slaughtering process is just as essential to the well being of the animal and the quality of the final product, as following the guidelines set in place for the animals during the course of their life. Mobile slaughter facilities could be a very useful asset to a specialty livestock operation, providing slaughtering services to smaller-scale farms, paying particular detail to the cut and quality of the meat because of it's smaller nature and capacity. Utilization of mobile slaughter facilities may help organic and specialty producers in collecting a market premium of the specialty meat products, as opposed to being processed in the conventional manner.

2.2) Supporting Organic Livestock Production with Mobile Slaughter

Although high animal welfare standards are a key component of an organic system (Jannesen, 2002) it is equally as important to look after their well-being before and during the slaughter process. For example, organic livestock producers face stiff challenges when it comes time to kill their animals according to certified organic standards (Morrigan, 2005*a*), but there are so many different principles a livestock producer must consider. As of now, there is no universal set of standards for the slaughtering of certified organic livestock. There are forty-five organic certification bodies across Canada (Morrigan, 2005*c*), and with each organic farmer using a different set of standards leaves the opportunity for inconsistent organic meat products. Jane Morrigan, a co-ordinator at the Organic Agriculture Center of Canada, stated that although there are many sets of standards governing the certification of organic livestock during slaughter, there are three key points that generally remain the same with each certification body:

- That animals be transported short distances to location of slaughter, helping to bring stress to a minimum.
- The segregation of organic carcasses from non-organic carcasses, and ensure each animal is properly identified.
- The carcasses are hung for a longer period of time, usually 10-15 days, as opposed to 5-7 days. (Morrigan, 2005)

In Canada, the present volumes of organic meat are still too small to interest processing plants in becoming certified organic. Consequently, it is important that farmers can verify to consumers

the organic status has been maintained through the slaughtering process in a non-organic slaughtering facility. (Jannesen, 2002). Organic producers prefer to see their livestock slaughtered as close to the point of production as possible (Macey, 2000). This being said, a MSU may be able to offer the low-stress, traceable certified organic processing service organic farmers are looking for. This is because of their ability to go to each farm to slaughter and their smaller capacity. The meat would not risk losing its organic status during processing, as well as the transportation issue relieving the stress to the livestock. It is also suggested in the International Federation of Organic Agricultural Movements (IFOAM) standards in section 5.8 concerning transport and slaughter that local and mobile slaughterhouses should be used when available (IFOAM, 2002).

2.3) Organic Processing Options in Nova Scotia

According to the 2001 Statistics Canada Census of Agriculture, there were ten reported registered certified organic livestock farms in Nova Scotia (Statistics Canada, 2004). Although this number may seem low, the question on certified organic farming was new to the 2001 Census of Agriculture, proving that organic farming is increasing in popularity in this region. (Also, due to both undercoverage and response errors, the number of farms producing certified organic products for sale is under reported, meaning there could be more than ten certified organic livestock farms in the province (Statistics Canada, 2004)). Due to a rising popularity of organic meat products, one would think there would also be a rise in the number of abattoirs offering certified organic slaughtering services, but this is not the case. According to a survey completed by nine of the twenty provincially inspected abattoirs in Nova Scotia, only two said

that they offer certified organic slaughtering services, one being services for red meat and the other for poultry (Melanson, 2005). Although when these same abattoirs were asked if they have noticed that specialty niche markets are growing and/or changing, five out of the eight answered that they have noticed an increase in the demand for such products, while one had commented that there were fluctuations in the markets (Melanson, 2005). Provincial abattoirs are stating that there is not enough demand to justify becoming a certified organic processing facility, yet at the same time, certified organic and specialty livestock producers are stating the services are limited.

Many organic livestock producers in the province have considered constructing a mobile slaughter facility to use for processing their livestock. One such farmer considered having one constructed to process his organic beef because he was transporting them too far within the province to be processed. He later dismissed the idea of a MSU because of the high economics involved with initially starting the unit. Instead, he currently rents a local abattoir and cooler space, hiring a butcher to do his processing closer to his farm. Another producer of free-range poultry and turkey, decided it was more convenient to have a stationary abattoir on-site rather than a mobile facility for similar reasons. The initial start-up costs were too great, as well as they required much more cooler space for the volume of production they have. Although for these farmers, mobile slaughter was not suited, they did first consider it to improve the quality of their meat products, but discovered more beneficial options for their businesses instead.

Section 3 - Food Safety and Meat Production

3.1) Concerns with Food Safety

The safety of foods has long been of crucial importance to the consumer, especially with the recent incidents of bovine spongiform encephalopathy (BSE) (Craig, et al, 2004). Other food borne illnesses such as *Escherichia coli* 0157:H7 have had consumers taking special care in the way they prepare their food. Many regulatory measures are in place to prevent meat with such diseases entering the food chain, but the concern is still there.

Canadian consumers are concerned about BSE, a progressive neurological disorder of cattle that results from infection from an unconventional transmissible agent called a prion. The nature of this agent is not fully understood (Center for Disease Control (CDC), 2005a). Outbreaks of the disease first began in the 1970's, being believed that BSE originated from feeding meat and bone meal to cattle containing scrapie infected sheep meat (scrapie being the ovine form of BSE). It is also believed that the outbreak was amplified and spread throughout the cattle industry in the United Kingdom by feeding rendered bovine meat and bone meal to young calves (CDC, 2005a). There are now precautionary measures set in place to help prevent the onset of an outbreak of BSE, including culling sick animals, and removing specified risk material (SRM) from meat and bone meal, destined for both human and animal consumption. SRM includes the skull, trigeminal ganglia (clusters of nerve cells connected to the brain and closely apposed to the exterior of the skull), eyes, tonsils, spinal cord and dorsal root ganglia (clusters of nerve cells connected to the spinal cord and closely apposed to the vertebral column) (CFIA, 2003). These SRM are tissues that, in BSE related cattle, have been shown to contain the infective prions and spread the

disease (CFIA, 2003). Very little is known about the effects in humans by consuming BSE infected meat, but it is believed that people who have developed Variant Creutzfeldt-Jakob Disease (vCJD), (the human form of BSE) had become infected through the consumption of cattle products contaminated with the agent of BSE. At this time, there is no known treatment for this disease, and it is generally fatal (CDC, 2005b).

Another important illness that is associated with the preparation of meat products, especially in ground beef, is *Escherichia coli* 0157:H7. This food borne illness is associated with eating undercooked, contaminated ground beef, but can also be transmitted through drinking unpasteurized milk or swimming in or drinking sewage-contaminated water (CDC, 2004). *E coli* 0157:H7 is one of the hundreds of strains of *Escherichia coli*, which can cause severe liver damage. This organism contaminates meat after evisceration and contaminates the ground beef in the processing. This illness manifests itself as stomach cramps, bloody diarrhea, and in some cases, liver failure in young children and the elderly. To avoid risk of an *E coli* infection, it is best to cook ground meat to an internal temperature of at least 160°F, keep raw meat away from ready-to-eat foods, drink only pasteurized milk, juice or cider, wash fruits and vegetables carefully, and avoid swallowing lake or pool water while swimming (CDC, 2004). Improving handling practices of meat in all stages of slaughter and processing, from maintaining clean livestock prior to slaughter, performing good hygiene practices during the slaughtering process, and proper handling while packaging and cooking meat can help reduce the incidence of *E coli* 0157:H7. Preventative measures should still be followed when preparing ground meat products to prevent this food borne illness from occurring.

3.2)Traceability

With a series of high profile food safety incidences heightening public awareness of food safety, it is important to have proper meat handling and traceability systems in place. Traceability is the ability to trace the history, application or location of an item or activity by means of recorded identification (Canadian Pork Council, 2004). The function of a livestock and meat traceability system is to allow trace-back of products or animals through the supply chain in the event of a food safety problem. It is also a way of providing food safety and quality assurance to customers (Hobbs, 2004). In larger, industrial abattoirs, there is a potential increase in the incidence of contamination, considering there are more people handling the meat. Also, as a result of the volume of animals being put through larger abattoirs, acquiring accurate, traceable meat products may also prove to be difficult.

For farmers who are interested in having a traceable meat product they can offer to their customers, as well as have their livestock processed in a facility with a low butcher to animal ratio, a mobile slaughter facility may be an option. Having the livestock processed on-farm would be easier to provide a reliable, traceable product for each animal. The risk of mixing animals from different sources would not be an issue, assuring an entirely traceable product. Having a guaranteed traceable product would especially benefit Canadian cattle farmers, whom it is essential to be able to track the whereabouts of every animal leaving and arriving farms and abattoirs.

Contamination that causes such illnesses as E coli could be reduced as well with the use of a MSU. With only one or two butchers working in a unit at a time, extra care can be taken to ensure that contamination is minimized with the goal of providing a clean meat product.

Butchers are able to inspect the meat more closely because, in most cases, only one animal will be processed at a time.

Section 4 - Environmental Concerns

4.1) Environmental Concerns and Abattoirs

With any slaughter operation, there are going to be environmental challenges associated with it. These challenges include the responsible disposal of blood and offal (viscera and trimmings of an animal often considered inedible by humans (Wordnet, 2005)), whether it be paying someone to remove the offal or composting it on-site. There are secondary environmental impacts that are also related to larger slaughter operations, including pollution from transporting the animals to the facility and the manure that accumulates in the holding facilities prior to slaughter. All of these must be addressed when operating a successful and environmentally friendly processing facility.

Most abattoirs in Nova Scotia use Rothsay Rendering to dispose of their wastes, a rendering company in central Nova Scotia who picks up the by-products on-farm. The cost for "waste" removal by Rothsay varies greatly depending on the distance that needs to be traveled, the volume of material being removed, the species, fuel costs and the quality of the material (Scott,

Henry, 2005). There is also a standard tipping fee involved with this service that is paid out to the company by the farmer. Years ago, Rothsay used to pay for the products they were removing, but as the costs of fuel increased, it eventually became a no-charge service. With the impact of BSE, they were then forced to implement service fees (MacVical, 2004). Due to the theoretical link between BSE and scrapie (the ovine form of BSE), Rothsay does not accept any part of sheep or goat carcasses, rather than simply ban just the high risk SRM contained in the offal. There are proposed federal regulations that could put restrictions on the use of SRM in rendered products. This means Rothsay would not accept SRM, and it would be the responsibility of the customer to remove the material before pickup would be accepted (Lindsay, 2005*b*). According to the survey completed by nine of the twenty provincially inspected abattoirs in the province, five stated they pay Rothsay to remove their offal, three compost/ recycle the by-products on-farm, and one stated that the offal is sold to a mink farm for feed (Melanson, 2005). Rothsay is still the method of choice, but farmers may be expanding their options to such practices as composting if the price of fuel, and pickup, continues to increase.

4.2) Research in Nova Scotia for Slaughterhouse Wastes

As a result of the fees Rothsay is charging, farm-based abattoir operators looked for alternate methods of disposing the offal. One farm-based abattoir was paying between \$1,500 and \$2,000 a month for Rothsay to remove the wastes from their business (Lindsay, 2005*a*). In efforts to find an alternative and cost-effective method for dealing with these "wastes" this abattoir, along with two other farm-based slaughterhouse operations became involved with a pilot project in co-operation with the Nova Scotia Department of Agriculture and Fisheries (NSDAF) and The

Nova Scotia Department of Environment and Labor (NSDOEL). This pilot project was looking at taking various economical, on-farm carbon sources (poultry litter, sawdust and manure) to use along with the abattoir by-products to develop a compost.

The finished, composted product is intended to be spread on the farm it was processed, but regulations for these procedures are still undefined. Because SRM is included in the composted product, the compost could contain prions, the suspected organism found in SRM which is believed to cause BSE. There is little conclusive research to prove that prions are destroyed during the composting process. Therefore, the concern is that by spreading compost containing SRM, the prions may build up in the soil, having potential detrimental effects. On the other hand, by using the compost on their own land, the appropriate precautions are being followed to keep SRM out of the food chain, having complete traceability on that farm (Lindsay, 2005a). Even though it is a very low risk that BSE infected prions would make their way into the soil, it is not a known zero risk. Every animal that is condemned is tested for BSE now. Therefore, in the event there is a case of BSE, the location of the carcass can be identified as it is composting (Lindsay, 2005a).

During the course of these pilot projects, these farm-based abattoirs are spending a little less than half of what they normally would for having the same quantity of material picked up by the renderer (Lindsay, 2005a). There is also the added benefit of generating a potential source of nutrients for crops, adding the composted product to the land. In the future, Nova Scotia abattoirs may be making some changes to the way they dispose of their by-products. If composting proves

to be an economical and secure method of disposal, it is possible they may follow suit with the three composting test sites, and discover an alternate method to save money, producing a valuable resource for their farm.

4.3) How a Mobile Slaughter Facility Can Improve Environmental Waste Output

MSUs are designed to process small numbers of livestock throughout a large area. As a result of their small nature, this ensures low daily outputs of animal waste, wastewater, and other emissions associated with their operation (Craig, 2004). By using a MSU, most of these environmental disturbances can be reduced. MSUs generally are not equipped to manage offal, and as the already existing MSU in the San Juan Islands, United States, offal is simply composted by the farmers using the facility. Upon speaking with Bruce Dunlop from Washington State about how the MSUs in the San Juan Islands treat their waste, he stated there is no waste. Everything generated from the units are of value, whether is it the meat processed, or the by-products (Dunlop, 2005). This compost can either be returned to the land when ready, be used as a nitrogen source to produce more compost, or can have a practical use as dry bedding for livestock housed inside. By combining on-farm slaughter and economical composting practices offers a low waste output operation that, at the same time, efficiently manages by-products on-farm.

Section 5 - Processing Facility Limitations

5.1) Availability of Trained Personal

In order to operate an efficient meat processing facility, it is essential to be properly trained for the job, whether is it on-the-job training, or in a recognized institution. Human Resources and Skills Development Canada states that the employment potential for retail and wholesale butchers and meat cutters in Nova Scotia is "good". In 2003, there were two job postings for meat cutters, compared to three in 2002 (Human Resources and Skills Development Canada (HRSDC), 2005). This indicates that the opportunities are on the high side of average in the Nova Scotia abattoir market, but a shortage nationally. The Globe and Mail stated on June 28th, 2004, that 6% of meat cutting positions are currently available and that the number is expected to jump to 15% within the next 5 years (HRSDC, 2005). One of the reasons for this is there is a shortage of meat cutting programs in Canada, and many butchers are at or near retirement, with the average age being 50 (HRSDC, 2005). This is also true for Nova Scotia, because according to a survey completed by nine of the twenty operators of provincially inspected abattoirs in the province, eight stated that they were above the age of 40, three of which were in the 60-70 year age category (Melanson, 2005). On the same survey, six out of the nine abattoirs who replied stated that they are not able to recruit or retain the kind of workers they require for their business (Melanson, 2005). Some reasons they stated why this is, is because it is not a high paying job, therefore people are not likely to seek work in a small abattoir as a career. Also, the nature of the job is not appealing to many people.

As mentioned, Canada is experiencing a shortage of meat cutting programs, with Nova Scotia being no exception. Kingstec Community College in Kentville, Nova Scotia had been offering a retail meat cutting course at their campus, being the only one of its kind in the Maritimes. During the summer of 2005, students enrolled in this retail meat cutting course would finish their practical portion, and that will be the last time the course will be offered in Nova Scotia, as the school is discontinuing the program (MacLeod, 2005). This course was a retail meat-cutting course, which qualified graduates of the program to work in retail meat cutting outlets, as Sobeys or the Superstore, not in a slaughterhouse. After speaking with Dwane MacLeod from the Kentville Community College, he said that they do not offer any kind of training for meat-cutters in slaughterhouses. The only training he said may be related to slaughter training is that while students were learning their practical skills (such as knife handling and pork cuts) at Larsens (a federal pork abattoir), some participants who were interested in slaughter were trained by Larsens in that department (MacLeod, 2005).

As a result of this lack of formal training in slaughterhouse meat cutting, the only training in the trade one may receive would be on-the-job. This would be done alongside the operator of an existing slaughterhouse, learning the basics all through hands-on experience. This may pose a problem to those interested in starting or operating a mobile slaughter facility. Unless the person interested in opening the facility is familiar with slaughtering livestock and had planned on being the butcher operating the facility, it may be difficult to find a qualified butcher to travel with the MSU that is not already occupied with another job. Another qualified person required for the operation of an abattoir is a meat inspector. For federally and provincially inspected meat, a

trained meat inspector must be present in the abattoir when slaughter is scheduled (Nova Scotia Department of Agriculture and Marketing (NSDAM), 1986). In Nova Scotia, there are only thirteen provincial meat inspectors that are responsible for servicing twenty provincial abattoirs (Feltmate, 2005a). In order for a mobile abattoir to have provincial inspection, it would require a meat inspector to travel to every location on days of slaughter. It would therefore be necessary to have more meat inspectors available to serve the mobile abattoirs, without cutting back services to the already existing, stationary facilities.

5.2) Economical Limitations

As there are no actual multi-species mobile slaughter facilities in Canada, only licenced butchers who can slaughter livestock on-farm. Comparisons will be made with the San Juan Islands units including a breakdown of the costs, as there are no real units in Canada to draw up a cost. A Washington-based truck body company, Featherlite, manufactured the self-contained MSUs (Rafferty, 2005). The entire cost to construct these MSUs was \$150,000 US. The breakdown is as follows:

- \$62,000 for the trailer
- \$ 16,000 for the truck to haul the trailer
- \$20,000 for equipment
- \$13,000 for design and installation
- \$39,000 for testing, modifications and insurance (Rafferty, Jo, 2005)

These prices could be altered, depending on the needs and wants of the person owning and operating the facility. Nova Scotia has a Featherlite company who manufactures and sells various truck trailers. While speaking with Pat McLean of Maritime Featherlite, she said their company would be willing to construct a mobile slaughter facility at the request of a customer. She said if one was interested in having one built, the customer would have to inform Maritime Featherlite of their exact requirements and intentions with the facility. From there they would be able to provide an estimate of the cost of constructing the unit. For this reason, Pat was unable to provide me with an estimate, because they could greatly vary (MacLean, 2005).

While speaking with a number of organic livestock producers in Nova Scotia about mobile slaughter, the majority expressed that their main concern was with the initial investment. Many revealed that they had considered mobile slaughter as an option for their specialty meat products, but did not know how the facility would be funded. The San Juan Island facility was funded by The Lopez Community Land Trust, a local non-profit organization in San Juan County that carried the financial process throughout the initial stages of the operation, until the co-op was formed and could start operating the MSU (Gregory, 2005a). The MSUs being considered by Nova Scotian farmers would be somewhat private ventures, and initial start-up costs would come out of the pocket of the producer. Also, a few producers stated it would be more economical to open a smaller abattoir, on-farm, using existing buildings and buying used equipment, rather than invest in a MSU, stating they would be able to construct a facility for under \$100,000.

5.3) Processing and Holding Capacity

The third major limitation related to mobile slaughter is the processing and holding capacity of the unit. Again, considering a MSU in Nova Scotia would be similar to the facility in San Juan Islands, the capacity is minimal. This facility can carry up to ten hanging beef per load, or approximately three tonnes (Gregory, 2005*a*). Also a normal load of for smaller livestock would usually consist of twenty lambs or twenty hogs. Mixing animals in a load is acceptable with proper hanging isolation, but the total weight of the load can not exceed six thousand pounds (Gregory, 2005*a*). This capacity can only be reached in a two-day period before the unit must unload the carcasses and refuel. For some farmers this set-up may be ideal, having to only process a small number of animals which may not require filling the unit to capacity. For others, this service may not be useful at all, requiring a higher processing capacity at one time. A few local livestock producers stated that although they had considered the idea of mobile slaughter, the small capacity for hanging and processing would not suffice for their needs.

Section 6 - Humane Slaughter and Meat Quality

6.1) The Importance of Humane Slaughter

Humane treatment of livestock prior to and during slaughter has both social and economic implications (Craig, 2004). Consumers like to know the meat they are consuming has come from animals that were raised in a way allowing them to exhibit natural behaviors, in a safe, sanitary environment. As a result of this, there is a demand for such specialty products as natural, hormone-free, organic, grass-fed and humanely raised meat (Morrigan, 2005 *b*) . Also, by

properly caring for livestock, maintaining good hygiene and raising calm animals, when it comes to slaughter, meat from these animals will have a higher value than products from animals that were subjected to a high level of stress pre-slaughter.

6.2) Pre-Slaughter Stressors and the Physiological Affects on Meat Quality

Transportation by its nature, is an unfamiliar and threatening event in the life of a domestic animal. It involves a series of handling and confinement situations that are unavoidably stressful which can lead to distress, injury, or even death (Grandin, 1993*a*). There are many stressful factors that can affect the welfare of an animal while it is being transported. These can include overcrowding, the process of loading and unloading, exposure to extreme temperatures, mixing of unfamiliar animals, being withheld from food and water for long periods of time, and being handled by unfamiliar people. Livestock that are exposed to these stressors have to cope with these dramatic changes in their life, and is usually done by physiological changes in their body. The reactions the body experiences ultimately determines the quality of the meat received post-slaughter (Fraser, 1990).

In cattle, the physiological reaction in the muscle to pre-slaughter stress is known as Dark Firm Dry (DFD), or "Dark Cutters" (Kreikemeier et al, 1997). In this dark cut meat, there is a depletion of the animal's energy store, glycogen, found in the muscle. This reduces the glycogen needed to produce lactic acid that reduces the pH of postmortem muscle (Grandin, 2004). Having an abnormally high pH increases the light-absorption and water-binding abilities of post mortem muscle, resulting in an undesirable, dark, firm and dry cut of meat (Lister, 1988, cited

from Grandin, 2004). Normal muscle pH in the living animal is 7.0-7.4. Approximately forty-five minutes post-mortem, pH decreases to approximately 6.4-6.5, while the ultimate pH is reached twenty-four hours post mortem, and is approximately 5.5-5.6. (Lawrie 1985, cited from Morrigan, 1999). These numbers can be compared with those of an animal that has been subjected to stress prior to slaughter. In dark cutting muscle, pH is approximately 6.8 forty-five minutes post slaughter, and 5.8 or higher after twenty-four hours (Lawrie, 1985, cited from Morrigan, 1999).

In pork, stress has similar adverse affects on the quality of meat. This condition is known as pale, soft and exudative (PSE) (Ewig, et al, 1999). Similarly, as with DFD in beef, this condition arises when there is an increased breakdown of the energy store, glycogen. Consequently, there is a high production of lactic acid, reducing the pH of the meat immediately after death. The water binding capacity of the muscle proteins declines, with water leaking out of the meat and the color becoming more pale and grey (Fraser, Broom, 1990). This is not appealing to the consumers looking for quality pork products, therefore PSE meat is discounted. Genetics of the animal also play a role in PSE. Slaughter pigs with different genotypes from the same production unit, subjected to identical pre-slaughter handling may show different values of meat quality parameters (Grandin, 1993*b*). DFD meat can also occur in pigs, but it is not caused by genetic factors. It is caused when the pigs are fatigued, and their glycogen stores are exhausted at the moment of slaughter. As a result of this, the shelf life of the meat is shortened as a result of an insufficient decrease in the pH (Grandin, 1993*b*).

In addition to DFD and PSE, there are other indicators that an animal has been subjected to stress pre-slaughter. Dehydration of the animal can be observed even before slaughter. If livestock do not have access to water before they are slaughtered, it results in a drier, sticky meat which has a higher water-holding capacity. The color may also be slightly darker with a slightly higher pH (Gregory, 1998). Bruising, an impact injury, is another indicator of trauma. Bruising can occur at any stage in the transportation chain, and can be attributed to poor design of handling facilities, ignorant or abusive stockmanship, and poor road driving techniques during transportation (Grandin, 1993*a*). Bruising can lead to the downgrading of carcasses and, at best, trimmed bruises will only find a market in ground beef (Gregory, 1998).

Controlling pre-slaughter stress of the animal through proper management would be the most effective method of reducing the incidence of these stress-related, meat-quality issues. Even after transport when livestock arrive at the abattoir, there are other factors which cause the animal stress. Dr. Temple Grandin, a designer of livestock handling facilities, states that there are five main causes of problems with animal welfare in slaughterhouses:

- A lack of supervision and well trained employees
- Poor maintenance of stunning equipment, restraining equipment, gates and other animal handling equipment
- Distractions within the slaughterhouse which cause the animals to balk or refuse to move
- The conditions of the animals arriving at the processing plant
- Design problems of the equipment (Grandin, 2004)

Being aware of these problem areas before subjecting livestock to transportation and other pre-slaughter stressors could help livestock producers gain a much better product, and a higher profit for their meat products.

6.3) Reducing Pre-Slaughter Stressors

Calm handling is the key to reducing stress and improving health and performance with livestock (Macey, 2000). By reducing stress, the adverse physiological affects on the meat quality can be avoided. A good way of ensuring livestock are less flighty come time to slaughter is to handle them early in life, so they are less disturbed by later human interaction (Grandin, 1993*c*).

Although this may seem labor intensive, the result will pay off in the end. Another means of reducing the stress to livestock pre-slaughter is to reduce the length of time the animals are in transit. Transportation is inevitably associated with a stress response, so reducing time on the road and improving handling while the animals are being loaded and unloaded will help reduce the animals response to stress (Grandin, 1993*a*). To help reduce the time the animals are on the road, the option of slaughtering as close to the point of rearing should also be utilized (Grandin, 1993*c*).

Another suggestion for eliminating the stress of transport and pre-slaughter handling is to slaughter the animals on the farm of origin (Gregory, 1998). This is where MSUs would be of a particular benefit, eliminating transportation of live animals from the process. As mentioned, reducing transportation relieves some stress experienced by livestock, so removing it from the slaughter process would be ideal. By slaughtering on-farm, not only is the livestock producer

saving money by removing transportation from their expenses, they are saving money from potential loss of the economical value of the meat. The animals would not be subjected to the stressors associated with transport. They would be able to stay in a familiar environment, surrounded by familiar herds mates, avoiding dehydration, bruising, and other associated biological stress responses. As a result, it can be assumed that the meat being processed in a mobile unit on-farm, would have a higher quality, and in turn, maintaining or gaining economical value.

Section 7 - Regulations, Requirements and Inspection of a Mobile Abattoir

7.1) The Importance of Regulations and Inspection

With the risks of extremely harmful food borne illnesses as E coli and salmonella, and major livestock and poultry diseases as BSE and the avian flu, it is important now, more than ever, to have a system of inspection set in place for meat processing facilities. There are also a number of "farm-gate" producers who are permitted to sell uninspected meat products directly to the consumer. By purchasing uninspected meat, consumers accept a certain level of risk of acquiring a food borne illness, as there are no regulations for these "farm-gate" operations to follow. Purchasing meat that has been processed in a provincially or federally inspected facility (as the same meat purchased at grocery stores) has been processed in an approved manner, under the supervision of a qualified meat inspector. Hygiene standards are set in place to help reduce the incidences of food borne illnesses, and prevent the spread of other harmful diseases. It is therefore in the better judgement of someone considering to operate a meat processing facility, to access some form of inspection, whether it is provincial or federal.

7.2) Environmental Approval

When considering building a new abattoir, the chief inspector of the provincial meat inspection program should first be contacted. They will provide complete information on abattoir construction and the operational requirements of the provincial meat inspection program (NSDAM, 1986).

After initial contact with the provincial meat inspector, the Department of Environment (DOE) needs to be contacted before construction, to gain approval for the environmental maintenance of the proposed site (Feltmate, 2005*b*). The DOE does not actually do the physical approval of the site. They hire what is known as a "qualified person", an engineer who works independent from the DOE to assess the plans and site of the facility (Feltmate, 2005*b*). Although a MSU would not have a fixed site, the DOE would still be involved with the initial approval of a MSU, and would require such information as:

- The volume of material generated from the facility
- The type of material to be processed
- The type of waste disposal system
- The area the unit would be covering (counties)
- Expected noise levels and control measures (i.e.: generators)

(Putnam, 2005)

From this, the engineer designs an appropriate disposal system for offal, blood and wastewater for the proposed abattoir. These designs are taken to the DOE where they are then approved. The approval process is not lengthy, as it starts as soon as the application is submitted to the Department. If the application is considered complete, the Department has 60 days to issue an approval. If the application is not considered complete, the Department has 14 days to notify the applicant and request the information necessary to make the application complete (Putnam, 2005). Once approval from the DOE is obtained, the rest of the inspection process is in the hands of the provincial meat inspector (Feltmate, 2005*b*)

7.3) Federal vs. Provincial Inspection

Although there are no provincially inspected MSUs in Nova Scotia, seeking inspection is not impossible. After gaining approval from the DOE, the provincial inspector is then contacted. The inspector is responsible for every aspect of the building / unit, including lighting, materials used for construction, product flow, ventilation, heat, water, and freezer capacity (Feltmate, 2005*b*). While speaking to William Feltmate, the provincial inspector for Nova Scotia, he stated that in order for a mobile unit in Nova Scotia to be provincially inspected, he would first have to find out other provincial requirements on mobile slaughter, to compare with those that are in Nova Scotia. He also said that there are no specific requirements that are needed for a MSU to be provincially inspected. Everything that a stationary slaughterhouse has would be required for a MSU, the only difference is that it would have wheels (Feltmate, 2005*b*). Once the other requirements from other provinces are gathered, the provincial meat inspector can help design an

appropriate layout for the MSU, one that would be able to acquire provincial inspection. When Nova Scotia abattoirs were asked if they thought it was more beneficial to be a provincially inspected facility rather than a non-inspected farm-gate operation, and it was quite clear with eight out of the nine answering yes. One person commented that the provincial inspection system was the “best marketing tool ever made available to agriculture, giving the consumer the protection they need for their food products”. Another stated that they did not agree with farm-gate producers, saying that “provincial abattoirs are dealing with double standards”. He continued to say that Provincial facilities have rules to comply to, while farm-gate products have no restrictions, “a disaster waiting to happen”. When these abattoirs were asked if they thought that Nova Scotia had adequate access to abattoirs, five out of the ten stated there was. One commented that Nova Scotia is working towards filling the gaps in the industry, while another commented that there are too many animals leaving the province to be processed elsewhere.

Currently in Canada, federally inspecting a MSU is not possible. There are two reasons why a MSU can not gain federal certification. First, the abattoir must be registered, and for that to happen, the facility must be fixed to one place, having one address (Gacek, 2005). According to Section 2.2 of Chapter 2 of the CFIA Meat Hygiene Manual of Procedures, it states "*Mobile establishments or trailer-like facilities that are intended for handling of meat products (or any materials which will come in direct contact with meat products or any packaging materials) are not permitted. This includes any mobile trailers that are temporarily attached to a building of a refrigerated establishment*" (CFIA, 2005). The second reason a MSU can not be federally inspected is because the operator of the facility needs to be licenced. Licencing the operator and

inspecting the abattoir go hand-in-hand, so if the facility can not be inspected the operator is unable to obtain their licence (Gacek, 2005). When Nova Scotia abattoirs were asked if they thought their operation would increase their business if they were a federally inspected operation, six out of the nine said they did not think it would. They commented that although having federally inspected meat would allow for another avenue to sell products, as long as major food chains are accepting provincially inspected meat, there would be no need to upgrade to a federal facility.

Section 8 - Conclusions and Recommendations

8.1) Conclusions

The feasibility of a MSU in Nova Scotia is not an idea to dismiss. Provincial regulations allow for a mobile facility to gain provincial inspection. However, a unit as this would not be eligible for federal inspection as of yet, for the Canadian Food Inspection Agency has not yet made changes to the regulations to allow mobile slaughter. Although federal regulation of mobile slaughter facilities is in the works, it is a lengthy process that can take a number of years to change (Gacek, 2005).

Livestock producers in Nova Scotia have expressed interest in mobile slaughter, especially organic and specialty producers. Many of these livestock producers considered mobile slaughter as a humane alternative of slaughter for their specialty meat products, but dismissed the idea for two main reasons: the initial start-up costs and the lack of adequate processing and holding

capacity. Such units as the San Juan Island MSU had grants to help fund their initial start-up costs until the co-op was up and running (Gregory, 2005a). For Nova Scotia farmers, operating a MSU would be a private venture, so government funding may be difficult to acquire, having to pay the majority of the initial costs from their pocket. A couple of the livestock producers also stated that they would not be interested in owning and operating their own mobile slaughter facility, but would rather have the services available to them provided by someone else.

Currently in Nova Scotia, there is no training available for those interested in perusing a career in abattoir or retail meat cutting. For those interested, the only training they can acquire is on the job. With worries of many abattoir operators approaching retirement and no trained personnel to fill the positions, Nova Scotia may have to address the importance of gaining access to these skills in order to promote the industry.

Nova Scotia has twenty operating, provincially inspected abattoirs in the province, with some geographic areas overlooked for slaughtering services. When speaking with abattoir operators and livestock producers, both stated that the southern shore of Nova Scotia, down past Shelburne and around Yarmouth, is an area that does not have any attention for slaughtering services. It was also commented by an abattoir owner that there should be more available slaughtering services between Truro and Cape Breton. Their reason for stating this is because within that distance, there are only three abattoirs available that are steadily busy.

8.2 - Recommendations

With one of the main concerns being the amount of cold storage available for the MSU, for it to be a success, there would have to be a separate, fixed structure used for the purpose of cold storage. This structure could complement the mobile facility, being rented when needed, or actually built on the farms using the mobile slaughter service, increasing the capacity of the unit.

A MSU may be suitable for poultry production. Considering the small carcass size, small amount of waste produced, and ease of handling, it may be reasonable to operate a mobile poultry processing unit. This way, many more carcasses could be hung at a time, the unit would not have to be as large, in turn, not as expensive to initially start as larger, red meat facilities. This would be especially helpful with the fear of the avian flu in Canada, acting as a “biosecure” option of slaughtering, reducing the risk of an outbreak.

Another option that Nova Scotia could look into is adopting the “mobile butcher” services as the units in Alberta, where the butcher is licenced to slaughter animals on-farm and take them back to a facility to have them processed and packaged for the farmer. The drawback to this system is that it is not provincially inspected, and meat processed in this manner could only be consumed by the farmer and their immediate family. This option would not be a retail venture, however, it would be an excellent alternative for livestock producers who have downed animals on their farm that are not able to be humanely transported to an abattoir. A facility as this may also be suitable for processing game species, as farm-raised deer which are known to be flighty and

difficult to transport, being an excellent alternative for these animals.

Provincial abattoirs are stating that there is not enough demand to justify becoming a certified organic processing facility, yet at the same time, certified organic and specialty livestock producers state that the services are scarce. Although many of the organic producers either can not afford a MSU or are not interested in operating one themselves, if the demand for sufficient services becomes too great, mobile slaughter could still be a solution. Starting a co-operative of provincial organic livestock producers to share the operation and expenses could prove to be an economical alternative to operating a MSU on their own. Producers could develop a market targeting consumers who would pay a higher premium for products processed in a mobile unit, especially along side of their specialty meat products. If a niche market could be developed, the higher costs of the meat could warrant the high operation costs of the facility.

Another idea that would have the same intention as a mobile slaughter facility, is to strategically place smaller, provincially inspected abattoirs in locations where they are most demanded. As mentioned, there is an opportunity for slaughter facilities along the south shore, and from Truro to Cape Breton. Placing small units in places as these would be more convenient than traveling farther to have the animals processed, and could be a cheaper alternative to starting a mobile slaughter facility.

For further research ideas for mobile slaughter in Nova Scotia, formally surveying livestock producers, both specialty and conventional would be valuable, gaining information on what is

demanded by the producers. Developing a survey for meat retail outlets could also prove to be valuable as to what the needs and wants of the consumers are. The next step in researching mobile slaughter in this province would be to perform an in-depth economic analysis to develop a realistic price for a Nova Scotian facility. Having this price range may encourage producers to become involved in the project once the price and design of the unit is specific to the needs of Nova Scotians.

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