

ABSTRACT

MATTHIS, JOHN STEVEN. Selected Employee Attributes And Perceptions Regarding Methods And Animal Welfare Concerns Associated With Swine Euthanasia. (Under the direction of Dr. Richard T. Liles.)

The purpose of this study is to determine selected employee attributes on their perceptions regarding swine euthanasia and to explore their animal welfare concerns associated with swine euthanasia. This study establishes the most prevalent personality types among swine employees in Eastern North Carolina. The following independent factors will be used to determine an employee's willingness to perform euthanasia and attitude toward euthanasia. These factors include socio-demographic factors, socio-psychological factors, farm factors, and euthanasia methods. The information was obtained by visiting 47 swine farms in eastern North Carolina where a total of 388 surveys were administered with a 100% return rate.

The objectives of the study were developed from the analysis of focus group participation and scrutinized by peer review. The selected objects for this research project include:

1. Which method of euthanasia, blunt trauma or carbon dioxide gas do employees prefer?

2. Does the employee perceive the pain of the pig an important factor when choosing a euthanasia method?
3. Do employees perceive safety as an important factor in performing euthanasia?
4. Which method of euthanasia, blunt trauma or carbon dioxide gas do employees perceive as being the fastest method of euthanasia for the pig?
5. What method of euthanasia training do employees prefer?
6. Do employees perceive the the time it takes to complete the euthanasia process an important factor in choosing a method?
7. Do employees perceive the euthanasia as being a stressful part of the job?
8. Is there a correlation between a employee's temperament and his or her willingness to euthanize pigs and his or her attitude toward euthanizing?
9. Do selected socio-demographic factors influence an employee's attitude toward euthanasia and/or willingness to euthanize pigs?
10. Selected socio-psychological factors do have an effect on an employee's attitude and/or willingness to euthanize.
11. Do selected farm factors influence an employee's attitude toward euthanasia and/or willingness to euthanize pigs?

12. Do selected euthanasia methods influence an employee's attitude toward euthanasia and/or willingness to euthanize pigs?
13. Does a combination of independent variables in the multivariate model influence an employee's attitude toward euthanasia and/or willingness to euthanize pigs?

The results of the survey concluded that regardless of their age, gender, or ethnic background, employees preferred a method of euthanasia that was perceived as less painful to the pig. The majority of the respondents have a personality type of ESTJ based on the Keirsey Temperament Sorter II. The swine employees in this study did not represent the INTP personality type.

Most of the employees did not feel stressed by having to perform euthanasia as long as the animal appeared sick. Most of the employees viewed euthanasia of a sick pig as a humane alternative to letting the animal die naturally. A majority of employees prefer to use a process that is less painful to the pig even though it may take longer. Most of the employees prefer to be trained on the farm. A majority of employees perceive blunt trauma to be the safest method for the 1 to 12 pound pig. A majority of employees perceive carbon dioxide gas to be safer than blunt trauma or the bolt gun method. A majority of the employees did not have a problem performing euthanasia as a part of their daily job functions.

**Selected Employee Attributes And Perceptions
Regarding Methods And Animal Welfare Concerns
Associated
With Swine Euthanasia**

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DEDICATION

To my wife, Paula, whose love and encouragement helped me complete one step at a time.

To my daughter, Marie, whose laughter and humor helped me through the tough times.

To my mother and father, who taught me the value of hard work and determination.

To my in-laws and extended family, who prayed for me when times got tough.

BIOGRAPHY

Steven Matthis was born April 22, 1952, in Clinton, North Carolina. He is the only son of Oscar Lee and Martha Annette Matthis. He worked and lived on a livestock and crop farm throughout his high school years, and graduated from Union High School in 1970. He attended North Carolina State University and graduated in 1975 with a Masters in Agricultural Education. He started his teaching career in Transylvania County, North Carolina, at Brevard High School. After two years in the mountains, he moved back to Sampson County and started an Agriculture Science Curriculum at Sampson Community College. In 1980, Steve decided to return to the farm full-time and raise swine, cattle and sheep. In 1993, Steve returned to the community college to start a new Livestock and Poultry Technology Curriculum. While in this capacity, he has been actively involved with the National Pork Board and serves on the National Pork Board's Education Committee.

Steve is currently the Division Chairman of the Agriculture and Industrial Departments at Sampson Community College, and works closely with livestock companies in the area by offering employee training. He is often sought to speak at swine and poultry conventions on farm maintenance and euthanasia issues. Steve currently resides in Sampson County on the family farm with his wife, Paula, and his daughter, Marie.

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It has been said that all things are possible with hard work and determination. That should be amended to "hard work, determination, *and help from friends.*" This spring a lifelong dream has become a reality for me thanks to the many people who have helped me on the way.

This process was truly a test of endurance. I started my education at North Carolina State University in 1970, and will complete the final leg of my educational journey 34 years later. I can honestly say this phase of my education has been the hardest and most time consuming, but at the same time it has been one of the most rewarding and enjoyable segments of my educational process. Even though the last six years have been seemingly endless at times, the process has given me a greater appreciation of the research process, the doctoral degree, and higher education in general.

The achievement would not have been possible without the guidance of the following members of my graduate committee: Dr. Richard Liles, Dr. Jerry Gibson, Dr. David Jenkins, Dr. David Mustian, Dr. Morgan Morrow and Dr. Todd See.

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solutions to every difficulty I encountered along the way. As the going got tough, his advice was the stepping-stone that helped me to make it through to the next level.

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A research project is not complete without an excellent statistician. Dr. David Mustian provided the expertise to accurately process and analyze the data. Without his help the project would fail to meet the expectation of industry and the scientific community.

Thanks to the guidance and wisdom of Dr. Morgan Morrow and Dr. Todd See, I was able to produce information with practical relevance to North Carolina's swine industry. Their dedication was critical in helping to guide the project in a path that developed knowledge that can be used on the farm to improve the welfare of both swine workers and the animals they care for.

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CHAPTER 1.

INTRODUCTION

The overall purpose of this study was to determine the influence of selected employee attributes on their perceptions regarding methods of on-farm euthanasia in swine and on their concerns associated with the animal welfare aspects of these methods. Animal welfare and euthanasia are sensitive issues in the animal industry today. According to the National Pork Board's new Swine Welfare Assurance Program booklet (2003), a pork producer's livelihood depends on the welfare and performance of the livestock. The National Pork Board (2003) states, "if an animal is mistreated or under stress, it will need to eat more feed to grow, will be more susceptible to disease and will generally not thrive" (p.3). This mistreatment could result in euthanasia by the employee, as most farm euthanasia is due to an untreatable illness or extremely "poor doing" pigs. An understanding of these procedures by the general public and the swine farm worker is of utmost importance to insure an acceptance and balance from the farm to the consumer. McGlone and Pond (2003) state, "The pig industry must address issues of ethical values and consumer perceptions. Although animal scientists work in the world of science, they cannot ignore consumer thinking and behavior" (p.25). The National Pork Board has several programs that deal with consumer demands and attitudes, including Pork Quality Assurance, Environmental Assurance and Swine Welfare Assurance Program. The purpose and intent of this study was to

determine if the euthanasia methods currently used are the preferred methods, or if there are other procedures that are better for the animal and for the employee performing the procedure. The variables researched include socio-demographic factors, socio-psychological factors, farm factors and euthanasia methods in order to determine the preferred on-farm euthanasia method. The study examines the personality types and demographics of swine farm employees, and how these relate to euthanasia and their willingness to euthanize pigs. The attitude and willingness of different ethnic groups toward farm euthanasia practices are also researched. Euthanasia methods are examined with regard to better meeting the animal welfare demands of swine employees and consumers.

In summary, the increased emphasis on animal welfare issues by consumers, the National Pork Board, the United States Department of Agriculture and individual swine companies shows the need for more research in animal welfare related to swine euthanasia. The swine companies' concern towards sensitive consumer and employee issues is evident by their participation in this research project. The swine industry must embrace these changes and be proactive to meet these demands in order to satisfy both consumers and employees. Thompson (2003) states, "We are entering a time when the public's demand for ethical treatment of farm animals is starting to register in the form of price premiums and special contracting requirements, as well as pressure for government action" (p.2). Additionally, he says, "This means

that although the ethical responsibilities of the individual husbandry man are still important, there is a growing need to examine the ethics of animal care on an industry-wide basis."

(p.1) Euthanasia is just one area that deserves immediate attention and assessment to reflect positive producer attitudes.

Significance of Euthanasia in the Swine Industry

The research could have a significant impact on animal welfare issues associated with on-farm euthanasia throughout the United States' swine industry.

Changing or modifying an existing production procedure or task is difficult, even on a small scale; however, economic factors could compel the swine industry to change an existing method or procedure to comply with consumer demands (Thompson, 2002). Many animal rights groups are steadily influencing public opinion on sensitive issues. McGlone and Pond (2003) list the Internet sites that are pro-commercial pig production and anti-commercial pig production. An examination of these sites confirms that the swine industry is at a crossroads in relation to sensitive issues such as euthanasia and animal welfare. Fast-food chains are demanding adherence to specified animal welfare standards before they agree to buy from a producer. This company policy is illustrated by McDonald's animal welfare guiding principles (McDonald's, 2003). Another example of consumer influence on animal welfare issues is

demonstrated by Florida's recently passed laws banning gestation crates (Burgdorfer, 2002). Tokach (2001) states, "move to outlaw gestation crates and/or farrowing crates could greatly reduce potential for future profit in industry" (p.88). Hartsock (2002) agrees, "this state-by-state approach is particularly devastating because if a banned management practice significantly reduces the efficiency of production, and therefore profits, producers in the targeted states will not be able to compete and will go out of business" (p.1). North Carolina could be next on the list of targeted states on animal welfare issues. Many critical issues deal with public perception, not sound research. Barnett and co-author's study (as cited in Harper, A 2002) states, "the issue of public perception should not be confused with animal welfare" (p.1).

A proactive approach based on theory and research is the best way to address consumer concerns regarding animal welfare and euthanasia. The swine industry realizes the importance of dealing with these sensitive issues quickly and thoroughly. Involvement in animal welfare research demonstrates the swine industry's commitment to developing euthanasia methods that provide for adequate pig and employee welfare and satisfy consumer demands. An example of this is the Swine Welfare Assurance Program produced by the National Pork Board, which program provides a standard for proper animal welfare practices.

The justification for this research project is evidenced by the emphasis placed on the sensitive euthanasia issue by

the swine industry. Appendix F illustrates the protocol used by employees of two major Southeastern swine companies for determining which pig to euthanize. The high profile of this topic is evident by the number of newspaper and magazine articles being published. Euthanasia, a topic that at one time was not talked about, is now making headlines (PETA, 2004). The animal cruelty charges of a Seaboard Farms employee illustrates the urgency of research in this area (Kletecka, 2001).

Many avenues could be explored following the completion of this research project. Some of these topics include:

- ★ Fine tuning the prescribed method of euthanasia, including new machinery, technology and technique.
- ★ Public awareness and acceptance of prescribed procedures.
- ★ Advanced studies on employee satisfaction on the job when dealing with sensitive issues.
- ★ Job placement; can the employee perform the task outlined in the job description?
- ★ How to approach sensitive issues in the animal industry in a proactive manner to avoid public outcry.

Linking theory and practice is an integral part of this research project. The prescribed methods of euthanasia currently used by the swine industry in eastern North Carolina are based on animal research by the AASV (American Association of Swine Veterinarians). Current company euthanasia policies

are stated in appendices G,H,I,J and K. This research determines the practical application of these methods as determined by the employees who work in the industry and complete the task on a daily basis. The swine industry must use research to determine which euthanasia method to implement, and how to train employees on techniques and procedures. Proper techniques and training are important for all employees, including new trainees and veteran swine herdsman. This research project explores the need for euthanasia training in the industry and the method of euthanasia training perceived as best by the employees.

Brewer (1982) states, although the actual process of animal euthanasia was documented as early as the sixteenth century, the lack of literature and research in the specific area of swine euthanasia indicates that swine euthanasia could be considered an emerging or under-researched area. According to Arluke (1992), euthanasia is a topic that people do not want to discuss. Euthanasia has been documented as a production practice, but not highly publicized due to the sensitive nature of the subject. Recent interviews with company representatives, coupled with media coverage reaffirms the idea that on-farm swine euthanasia is receiving recognition as a sensitive animal welfare issue and needs to be dealt with in a timely manner.

A literature review reveals that the euthanasia process has been researched more extensively from a laboratory animal perspective than from a farm animal perspective. According to

the AVMA (2000), "Whenever possible, a veterinarian experienced with the species in question should be consulted when selecting the method of euthanasia, particularly when little species-specific euthanasia research has been done" (p.672). Additionally, there is a lack of research on how the swine caretaker feels about the euthanasia process. Arluke (1992) completed studies involving laboratory technicians and their feelings about euthanasia. Arluke (1992) found uneasiness and a feeling of guilt among laboratory workers. Other emotional reactions of laboratory technicians include grief, anger and frustration (Walshaw, 1994). Shapiro (2000) states, "they show this dedication by doctoring these animals when they are injured or ill and by crying for them when they accidentally die or are shipped to market at the end of their productive lives . . . they are farmer's friends" (p.152). Swine employees could presumably have emotional reactions to euthanasia that resemble the reactions of laboratory technicians.

The news media and consumer perception have a defining role in how companies produce their product. Kaufman (2000) states, "McDonald's restaurant chain yesterday launched a major effort to improve the way egg farmers care for their hens - a move that reflects rising scientific and public concern over how farm animals are treated" (p.1). For example, current trends in the meat export market are influencing production methods. According to Smithfield Foods representative Terry Coffey, the company's Animal Welfare

Policy (2002) states, "we will comply with all laws and regulations applicable to the animals' health and welfare and we strive to enhance our animals' well being and value" (p.18). Smithfield Foods sets standards to meet consumers' expectation for quality and safe pork products. The Food Marketing Institute in the June 2002 report states, "retailers, animal welfare experts, animal welfare advocates, producers, processors and the public share the common goal that all animals used in agricultural production be cared for in a manner that takes into account their daily well-being and health" (p.1). Another example of animal welfare standards and consumer acceptance is the British "farm assured" red tractor logo. Lawrence (2002) states, "the red tractor is promoted as a 'promise to consumers that food has been produced to meet exacting food safety, environmental and welfare standards" (p.1). These practices are evidence of how seemingly small, insignificant issues have a large economic impact on an industry. The livestock industry cannot allow a sensitive topic like euthanasia to become a media issue similar to the recent environmental publicity related to hog lagoons. Due to increased public pressure and negative press, The Environmental Defense Fund (1999) issued a report citing the "severe threat" to public health and the environment associated with hog waste lagoons. This report calls for the adoption of a solution package in 1999. The impact of the environmental report could have widespread economic repercussions on the swine industry. Although these issues are

not directly related, they illustrate the need to deal with sensitive issues before the media adopts them. McGlone (2001) states, "it is possible for the industry to be forced or encouraged to change based on the following forces on the industry: economic pressures on the pork industry, direct legislation, international trade requirements, and direct market forces" (p.1). The industry must be looking for all possible problems in advance to avoid bad publicity and possible economic loss.

Current Farm Euthanasia Situation

A lack of scientific research on specific farm animal euthanasia practices and failure of farms to accept a designated euthanasia method have led to a variety of methods being administered by farm employees. The American Association of Swine Veterinarians and the National Pork board published "On Farm Euthanasia of Swine-Options for the Producer." This booklet lists the various acceptable methods that producers use to euthanize pigs. In the absence of a designated farm protocol, euthanasia could vary from farm to farm. The farm manager chooses the euthanasia method that he or she prefers, with no thought given to the process, safety, pig pain or employee distress. According to D. Bishop (consultant and 2003 animal welfare team member for Smithfield Foods), prior to 2001 the primary method of euthanasia on

company farms for swine weighting more than 12 pounds to market was the gunshot.

New production protocols (Appendix L) reveal the rifle or gunshot is no longer used as the primary source of euthanasia on company farms due to employee safety issues. The rifle has been replaced on many company farms with the bolt gun. The bolt gun has been determined to be a safer method of euthanasia by most companies. The bolt gun method of euthanasia conforms to the companies' policy of "no guns allowed on farm premises." According to Dennis (1988), the rifle is considered dangerous due to the possibility of ricochet when used inside the facility. Company representative M. Daughtry (personal communication, December 2003) confirms the rifle is still used by many independent swine farmers and contract growers to euthanize pigs. Company farm polices do not govern independent farms and contract growers. The gunshot is an approved method of euthanasia by the American Association of Swine Veterinarians (NPB, 2003).

Several swine companies that utilize employee handbooks have incorporated a section in the handbook that describes the company's prescribed euthanasia methods. Appendices G, H, I, J and K exhibit company euthanasia polices. Even though many companies have existing euthanasia polices, they do not have enough information concerning the human perception of euthanasia from a farm employee performing the process or the consumer that purchases the final products. The animal welfare issue is more than a local or United States concern,

the Queensland government of Australia has also developed "Animal Welfare Standards." The article "Animal Welfare Standards: An Introduction to codes of Practice" (DPI.GLD.GOV. 2004) states, "consumers want assurances that animals used for production are raised in a way that safeguards their welfare" (p.2). The marketing experts in Queensland state, "to be competitive, animal product exporters like Australia will need to match international standards on food safety, animal welfare, and traceability". McGlone and Pond (2003) state, "Pig farmers and students should be fully aware of societal concerns and be able to discuss them in a logical and rational manner to work toward solutions that are compatible to the producer and the consumer" (p.32). Marketing a farm commodity begins at the farm level and carries through to the retail consumer and must address emotional issues that affect not only producers, but also the animals in their care and the consumers who utilize the final product.

Current Euthanasia Policies

Contact with all companies involved in the survey process reveals a variety of company policies dealing with swine euthanasia (Appendix G,H,I,J and K). Many of the companies describe the company's euthanasia procedures in the personnel handbook (Appendix G). Several of the companies describe the euthanasia process by referring to the swine euthanasia handbook developed by the AASV and published by the National

Pork Board (2003). According to J.Latham (personal communication, March 29, 2004), who participated in implementing the animal welfare management system in one of the companies participating in this survey, during the pre-employment interview, the types of daily tasks an employee is expected to perform on the farm are discussed by the Employment Manager. Any prospective employee who has no previous experience working with swine is given an on-farm tour. The tour is done to ensure the prospective employee is aware of the environment on the farm. The tour also includes expectations regarding animal welfare. The farm manager with whom the new employee will be working usually completes the on-farm tour. If the new employee objects to the expected daily tasks, the employee can discuss the problem with the manager.

Background Information

Euthanasia is defined as a humane death occurring without pain or distress (NPB 2003). The AVMA (2000) suggests the euthanasia process could be aesthetically displeasing. The term conjures up unpleasant images in the minds of many animal caretakers. Arluke (1994) suggests animal shelter workers feel a conflict between nurturing for animals and euthanizing animals. The fact remains that euthanasia is necessary in some form and at some time in most areas of animal husbandry.

All creatures born on earth have an estimated life expectancy. Workers in the field of animal research, veterinary medicine and commercial animal production are required from time to time to euthanize animals before they reach their full life expectancy. In the commercial swine industry in North Carolina, some of the reasons for euthanasia include potential disease risk to other animals and relief of suffering for animals too sick to recover.

As documented earlier, euthanasia is quickly becoming a sensitive and highly political issue in the area of animal welfare. Two areas that continue to be a problem in the swine industry are the perception of animal welfare from a public perspective and the perception of animal welfare from an employee view. Grandin (1987) suggests, "rotating the euthanasia responsibility among employees prevents a mechanistic approach to the animals" (p.206). The Arluke study (as cited in AVMA, 1991) states, "Constant exposure to, or participation in, euthanasia procedures can cause a psychologic state characterized by a strong sense of work dissatisfaction or alienation, which may be expressed by absenteeism, belligerence, or careless and callous handling on animals" (p.675).

The Humane Society of the United States (2000) in the White Paper document, suggest the animal welfare issue is important from a public perspective. The fast food industry, which consumes large amounts of pork products, is setting animal welfare standards for the purchase of meat and eggs

from producers (McDonalds, 2003). One of the concerns associated with animal welfare is the euthanasia methods currently used in the swine industry. These companies, encouraged by special interest groups like PETA, want to make changes in methods of animal handling associated with animal welfare issues. An article in Business Ethics magazine quotes the CEO of McDonald's, Jack Greenberg, saying, "McDonald's wants to take industry leadership in animal welfare" (Kaufman, 2000,p.7). Kaufman (2000) states, "If Mcdonald's required changes, suppliers will comply" (p.7). If the food industry rejects the swine industry's methods of animal welfare, a serious economic impact could occur. McGlone (2001) suggests, that science should be used to make animal welfare decisions. McGlone suggests, that if animal welfare changes are made by animal rights activists instead of by using research and science, then farmers could be penalized for providing improved animal welfare. An example of economic loss could be the need to retrofit gestation crates to open pens to conform to Florida's new law banning gestation crates. McGlone (2001) states, "When the science is laid-out before reasonable people, there is not much scientific justification to ban the crate—maybe we have not done enough studies, but even still, the science is not there today to ban the crate" (p.2). Using direct legislation and economic pressures could become a reality dealing with animal welfare related to on-farm euthanasia (McGlone 2001).

This research looks at euthanasia from a farm employee's perspective. The research explores the evolving issues and challenges, including animal rights issues, employee emotions, and employer job requirements, using the best euthanasia procedures available and matching the employee with the job. If these sensitive issues are not handled properly, the result is high employee dissatisfaction resulting in high turnover (AVMA 2000). Employee turnover results in higher company expense and lower productivity (McGlone, Pond 2003). There are many other related issues that intensify this critical area of human/animal relationship. The following list gives a glimpse into the background and complexity of the euthanasia issue:

01. Human animal bond (White,1996)
02. Grief issues associated with euthanasia White,1996;
Walshaw (1994)
03. Strategies for coping in the workplace (Arluke,
1992)
04. Training of employees on coping techniques
(Arluke,1992)
05. USDA regulations on animal welfare (Code of Federal
Regulations, 1992)
06. Animal welfare regulations (Aphis.usda.gov)
07. Age related issues (Walshaw, 1994)
08. Compassionate care of animals (Walshaw, 1994)
09. Public opinion (White, 1996; AVMA, 2000)
10. Employee work-related responsibilities (AVMA, 2000)

The magnitude of this problem mandates that the swine industry be proactive in their pursuit of a solution to the problem of animal welfare, specifically with regards euthanasia practices.

Gaps In The Research

The National Pork Board reports a steady growth in the pork industry since 1970. Rapid growth creates production problems in many segments of an industry when areas of production are overlooked from a research perspective. Most of the previous euthanasia research involves laboratory animals and technicians, because the research laboratory has the most concentrated number of animals that need to be euthanized at one time. Other research involves dog pound or animal shelter workers. According to the Humane Society of the United States (1992), animal shelters in the United States euthanize approximately eight million unwanted dogs and cats every year. Animal pain and employee emotions can be more easily measured in a laboratory setting than on the farm.

According to the Pork Facts (2000), the number of swine production units has decreased, but the size of the farms has increased, resulting in fewer farms owned and operated solely by family members. Formerly, animal euthanasia was considered a part of farm life, and little need was perceived for extensive research in this area. Armstrong (2004), at the first-ever scientific conference on animal handling, described

"how public perception of the meat industry has changed as society has evolved from its agricultural roots and as activist organizations affect public opinion, both in the United States and world wide"(p.1). Armstrong (2004) cautions, "noting the relatively small numbers of researchers working on animal welfare issues and the need for greater focus and funding . . . the meat industry and the research community must be part of the solution by working together and by implementing science-based guidelines focusing on welfare, economics, food safety and consumer concerns" (p.2).

United States Senator Elizabeth Dole (Friends of Agriculture Seminar 2004) states that the farm family population has decreased drastically in the past 100 years to approximately 2 percent of the population. Thus a conclusion could be made that many of the workers currently working on company farms did not grow up on a farm or have previous farm experiences. This lack of experience, training, and professional support in reference to repeated animal euthanasia could result in a failure to comprehend the realities of animal production and lead to misunderstanding or unpleasant experiences on the job, with concomitant high employee turnover (AVMA, 2000).

A review of the literature yielded several similarities between the euthanasia of research animals and the euthanasia of farm animals. Farm and research employees use many of the same methods of euthanasia (AVMA, 2000). Both farm workers and laboratory technicians considered themselves animal

caregivers and at the same time performed euthanasia on the animals they were caring for (Walshaw, 2002). Shapiro (2000) states, "the strong attachment or feelings the farmer has towards his or her stock can best be demonstrated by the dedication he or she has in delivering young calves, foals, lambs, and piglets by breathing into their mouths and giving them the first breath of life" (p.152). All methods of euthanasia that are used on swine farms are approved methods of euthanasia by the AASV (National Pork Board, 2003). That a method is prescribed as a correct method for performing a task does not mean it is the only method that can be used effectively. A gap in the research is present in the area of swine piglet euthanasia and human emotion. Most of the current research deals with laboratory technicians and animal shelters, but by extension a presumption could be made that hog farm workers might have similar emotional reactions.

Research reveals that animal shelter workers have emotional problems dealing with euthanasia (White, 1996). If emotional problems described by White (1996) are consistent among animal shelter workers who have to euthanize large numbers of animals, then possibly the same problems could exist in the swine industry. This factor alone could cause serious employee distress. Development of alternative methods could possibly decrease the emotional anxiety associated with the process.

Millar (2000) reported that the euthanasia methods associated with gunshot are not performed with consistent

accuracy. Human error and placement of the shot created a less than perfect means of death. The inconsistency of the bolt gun and other means of blunt trauma associated with human error could allow for unnecessary pig pain during the process. This research project will explore the idea that the blunt trauma method requires a forceful physical act that is considered distasteful by many employees. Performing euthanasia on baby piglets using carbon dioxide gas, similar to the process used in the euthanasia of laboratory rats researched by Hackbarth (2000), could result in a more consistent euthanasia process with less physical action by the employee. The piglet welfare could possibly be improved by using carbon dioxide gas euthanasia. The carbon dioxide process eliminates the need for a majority of the physical activity by the employee. During the survey process, many of the employees had questions about pig pain and suffering during the euthanasia process.

Gaps in the research exist in the use of personality profiles on swine farms. Ravel (1996) states the literature reveals that swine farm workers tend to have personality profiles that are different from the typical population. A better understanding of farm employee personality types could play an important role in emotional reaction to euthanasia and resulting employee job satisfaction.

Further personality profiling could yield helpful information about employee job placement preferences. There are many different tasks that need to be performed on a daily

basis on a modern swine facility. Some of these tasks could be stressful to employees. Possibly new employees could be pre-tested and screened for a particular placement. Correct placement could be improved by understanding an employee's personality and his or her willingness to perform certain tasks. Farm managers need to be sensitive toward employee feelings about animal welfare and euthanasia issues. According to White (1996), animal shelter workers may experience considerable emotional anguish from participation in animal euthanasia. There is very little research in the area of swine euthanasia, but farm workers could experience the same emotions of sadness and unresolved grief. Matching personality types to performance tasks, specifically euthanasia, could benefit both employers and employee.

Statement of the Problem

Animal welfare and euthanasia issues are increasingly becoming targets for the news media and animal welfare groups. A list of special interest animal welfare group sites is found on the internet, many of which create displeasing images in consumers' minds. As reported by the Southwest Daily Times, a former Seaboard Farms employee faces animal welfare charges for improperly euthanizing a pig (Kletecka, 2001). Images and issues dealing with animal welfare issues are becoming more noticed by the consumer due to media coverage and special interest groups. Are these issues the result of a lack of

company policy, employee training or employee attitude? These concerns range from the methods used to euthanize the pigs to the emotions of the farm employees completing this task. Companies are hiring specialists in the field of animal husbandry such as Temple Grandin to help solve problems from production to slaughter. One example is the euthanasia audits performed by Grandin (2002) at an Excel meat packing plant to see if the plant meets McDonalds animal welfare standards.

In the swine industry, the largest number of pigs being euthanized occurs in the pre-weaned baby piglet stage. McGlone et al. (2003) states, "preweaning mortality is 20% on average in the United States, but under 15% on well-managed farms" (p.277). Farm employees must euthanize a percentage of these pigs to reduce pain and suffering of pigs too ill to recover. These piglets require the most care and nurturing by the farrowing house workers. According to Walshaw (1994), there are advantages to the human-animal bond in the laboratory; kindness and concern for animals are very desirable characteristics in animal care. The emotional conflict occurs somewhere between an employee being able to nurture an animal and being able to euthanize them when necessary to reduce pain and suffering. Another concern is the method used to euthanize. This research addresses euthanasia methods currently used on the farms and methods considered by the employee as being the preferred method for reducing pig pain and employee discomfort. The methods currently used to euthanize pigs on the farms in the research population are

approved by the American Veterinary Medical Association and the National Pork Board (Appendix M). Initial focus group analysis and a review of company protocols reveal the farms participating in the research use the blunt trauma method of euthanasia for piglets one to ten pounds. This method involves a quick blow to the head causing instant unconsciousness. The blunt trauma method is considered fast, safe for employees and economical to perform (National Pork Board, 2003). This research attempts to determine whether the employees performing the task perceive blunt trauma as the preferred method, or whether a carbon dioxide gas protocol is preferred.

The main focus of this research is related to the methods of euthanasia currently being used in eastern North Carolina to euthanize baby piglets. This research focuses on alternative methods of euthanasia that are less painful for the piglet, easier and safer for employees to perform without presenting emotional problems, and more aesthetically pleasing and acceptable from the public viewpoint. The research evaluates the employees' attitudes and willingness to perform euthanasia.

Four concepts are used in the theoretical framework of the project. The four factors include:

- ★ Socio-demographic Factors
- ★ Socio-psychological Factors
- ★ Farm Factors
- ★ Euthanasia Methods

Purpose and Objectives of the Study

There are many areas that could be researched dealing with animal welfare and swine euthanasia. As discussed earlier, there are rapid changes taking place in the livestock industry, especially in the size and socio-demographic makeup of the employees. Livestock producers are steadily looking for accepted and improved methods of animal handling and husbandry. Continual changes in the industry are forcing industry to look at scientific research to support accurate decision-making in all areas of animal production and welfare (Thompson, 2002). To reemphasize this point, the National Pork Board has developed a new certification program focused on animal welfare. The program is named the Swine Welfare Assurance Program (SWAP). According to local industry representative M. Daughtry (personal communication), this certification will be an integral part of their employee training program.

Temple Grandin's (2002) animal welfare audits confirm that consumers prefer a proactive response to sensitive issues rather than a reactive approach. Consumers want to know the food they eat is being handled humanely, from birth to harvest. Current information on various euthanasia techniques and their effects on animals are publicized in the 2000 Report of the AVMA Panel on euthanasia.

Research is limited on the effects that euthanasia has on the caretakers of commercial farm animals. Research conducted

with animal shelter workers and research laboratory technicians is used in the literature review section of this euthanasia study. Arluke (1992) states that many research and animal shelter workers have serious problems with caring and nurturing animals, knowing that the final destination of the animals is death by their hands. This project attempts to determine whether swine industry employees have the same problems associated with euthanasia as the shelter employees cited in Arluke's study.

The AVMA (2000) and the National Pork Board (2003) defines euthanasia as a quick and painless death. One of the goals of this research is to determine if employees working in the field of swine production believe euthanasia is being accomplished in the most humane way possible. If the research concludes a negative response, which of the euthanasia methods prescribed by existing research completes the task most humanely?

The temperaments of the employees working in the swine industry are ascertained by using the Keirseley Temperament Sorter II. The temperaments of the employees are compared to the overall population and other farm employees' populations. Ravel, Allaire, Bigras-Poulin, and Ward (1995) state, "the parallel description of the independent stockpersons and of those working for organizations tends to show a common psychological profile that may be related to the type of work" (p.247). Evaluations of the data are done to determine if selected employee attributes and perceptions regarding methods

and animal welfare concerns associated with swine euthanasia are important to future decision making in the swine industry. The perceived attitudes and willingness of the employees to perform euthanasia are explored as this could have an effect on job satisfaction and decreasing employee turnover.

Listed below are the objectives of this euthanasia study.

Research Questions

Specific research questions addressed by the euthanasia study include:

1. Which method of euthanasia, blunt trauma, electrocution, lethal injection, bolt gun, rifle or carbon dioxide gas, do employees prefer?
2. Does the employee perceive the pain of the pig an important factor when choosing a euthanasia method?
3. Do employees perceive safety as an important factor in performing euthanasia?
4. Which method of euthanasia, blunt trauma or carbon dioxide gas, do employees perceive as being the fastest method of euthanasia for the pig?
5. What method of euthanasia training do employees prefer?
6. Do employees perceive the time it takes to complete the euthanasia process as an important factor in choosing a method?

7. Do employees perceive the euthanasia of pigs as a stressful part of the job?
8. Is there a correlation between employees' temperament and his or her willingness to euthanize pigs and his or her attitude toward euthanizing?
9. Do selected socio-demographic factors influence an employee's attitude toward euthanasia and/or willingness to euthanize pigs?
10. Selected socio-psychological factors do have an effect on an employee's attitude and/or willingness to euthanize.
11. Do selected farm factors influence an employee's attitude toward euthanasia and/or willingness to euthanize pigs?
12. Do selected euthanasia methods influence an employee's attitude toward euthanasia and/or willingness to euthanize pigs?
13. Does a combination of independent variables in the multivariate model influence an employee's attitude toward euthanasia and/or willingness to euthanize pigs?

Assumptions and Limitations of the Study

According to swine industry human relations personnel, the swine industry employee population in North Carolina encompasses a broad range of cultural and ethnic backgrounds. The largest group of non-English speaking employees is of Spanish descent. Industry representatives estimate between 40 and 50 percent of the farm employees speak Spanish (L. Torrez, personal communication, March 11, 2004). Several of the company farms are staffed totally by Spanish speaking employees. Steps have been taken in the research process to help eliminate possible population bias; a translator was available when needed to interpret materials or videotape. The majority of the employees surveyed are Black, White or Hispanic. Both of the surveys, the euthanasia survey and the Keirseley Temperament Sorter II were translated into Spanish to help facilitate the accuracy of the Spanish-speaking workers.

Another factor that affects the reliability of the study is the sample population's educational level. Preliminary employer information and focus group responses confirm that many of the Hispanic swine workers have less than a twelfth grade education (Appendix B). The survey is written in a manner that helps accommodate an employee with lower reading skills. An effort was made to read or translate the necessary information to employees who could not easily comprehend the survey information. The temperament sorter was translated by the publisher and was not altered.

The sampling procedure used in the study may create a limitation. The project's sampling procedure was a stratified random sampling technique. All of the farms in the population were eligible for consideration. Due to biosecurity measures placed on certain farms after the selection process was completed, two farms were eliminated, keeping them from completing the research. There is a chance that farm elimination could cause an uncontrollable selection bias.

Arluke (1992) explores the sensitive nature of euthanasia among laboratory research employees. The sensitivity of the subject could cause farm employees to be reluctant in answering the questions, or to answer them according to company policy. The participants in the survey understood that their employers supported the euthanasia project and that their responses to the survey questions were a true and accurate response of their feelings on the swine euthanasia issue. All employees felt free to express themselves through the survey, and did not feel encumbered by farm managers, fellow workers or past experiences. All employees were notified prior to the survey as to the importance and accuracy of their responses.

The total length of the survey could create a limitation to the accuracy of the study. The euthanasia survey has approximately 50 short, easy-to-read questions. The estimated time to complete this portion of the euthanasia survey is approximately ten minutes. The Personality Profile has 70 questions. This portion of the survey has an estimated time of

ten minutes to complete. Both of the surveys were translated for the Spanish-speaking employees. Incentives were given to encourage all participants to take their time and complete the survey as accurately as possible.

Human perception and understanding of euthanasia practices described in the video could play an important role in the outcome of the survey. The author of the study performed the video viewing and survey procedures. This helped eliminate any bias associated with these procedures.

Definition of Terms

The terms used in this euthanasia study are common to euthanasia literature, farm workers, animal researchers, and educators in the livestock industry. The terms defined below help develop a better understanding of this euthanasia research.

AASV - The AASV is an acronym for the American Association of Swine Veterinarians.

Animal Distress - Animal distress is created when an animal is placed in an unfamiliar environment or the animal is subjected to excessive pain.

Animal Welfare - Animal welfare is the act of doing what is best for the animal.

AVMA - The AVMA is an acronym for American Veterinary Medical Association.

Biosecurity - Biosecurity is the processes used to limit disease entry into a herd. Companies have different policies regarding biosecurity.

Blunt Trauma - Blunt trauma is the euthanasia procedure used on animals to obtain a fatal head injury by striking with a blunt object.

Captive Bolt - A captive bolt is a gun-like piece of equipment that projects a 4" metal rod into the skull of an animal. The animal is incapacitated from the action of the metal rod.

CO₂ - CO₂ is a natural gas found in the atmosphere in small amounts.

Dyspnea - Dyspnea is the term used to describe animals that have difficult or painful breathing.

Euthanasia - Euthanasia is the act of killing, for reasons of mercy, individuals that are hopelessly sick or injured.

Farrowing - In the swine industry, farrowing is the term used to explain the process of giving birth.

Free Bullet - A free bullet is a projectile shot from a handgun.

Homeostasis - Homeostasis is a relatively stable state of equilibrium or a tendency toward such a state between the different but inter-dependent elements or groups of elements of an organism or group.

Hypoxia - Hypoxia is a loss or displacement of oxygen to the brain. Loss of oxygen to the brain will cause death to the animal.

Independent Farmer - An independent farm is a family owned farm unit.

Pre-weaning - Pre-weaning refers to baby pigs before they are weaned from their mother.

Sedated - A sedative is a drug to lessen the pain of an animal. Some animals must be sedated before euthanasia.

Service Person - Service Person is a company employee that visits farms on a routine basis and makes suggestions to improve production and helps train employees.

Stock Person - A stock person is an employee that feeds, medicates, and controls the pigs' environment.

Vertically-Integrated - Vertically-integrated refers to the process of owning all aspects of the industry from production to processing.

Organization of the Study

Chapter 1 includes a statement about the significance of the project, current farm situation, background information, gaps in the research, statement of the problem, purpose of the study, research questions, assumptions, definitions, organization, and summary statement. Chapter 2 includes the literature review and conceptual framework related to the study. The research design, the description of the population, the survey instrument and the analysis of the data are discussed in Chapter 3. Chapter 4 explains the results of the data. Demographic information of the respondents is also discussed in Chapter 4. Chapter 5 yields the conclusion, implications and recommendations of the study.

Summary

The swine industry is steadily trying to improve the processes related to pig production as well as to satisfy consumer demands for animal welfare. The industry's goal is to furnish a high-quality product that is as economical as possible and does not jeopardize the emotional well-being of the employees or the welfare of the animals. Like any other industry, the swine industry is slow to spend money on areas that have not been proven through appropriate research.

The swine industry has been plagued the past few years with environmental issues that could have been minimized by

being more proactive. Because of past experiences, the swine industry is ready to participate in research to help resolve animal welfare issues before they become items of contention.

The swine industry is in tune with the perceptions of special interest groups and employees. The industry is increasingly aware that an educated employee is a better employee and will save the company money, but an educated employee is also an inquisitive employee. An educated employee wants the company to supply reasons for the methods used in various areas of production. If employees read or hear about a better way of performing a task, they ask questions and want realistic answers. Further research on euthanasia methods facilitates change and improves employee/public perception of a necessary process. Employer and employee must be satisfied that the method of euthanasia used is safe, accepted, economical, and humane.

The American Veterinary Medical Association and the American Association Of Swine Veterinarians are continually updating methods of euthanasia for all species of animals (AASV, 2003). History reveals that industry as a whole tends to choose the least-cost method to produce a product. The swine industry has adhered to this in the past, but today is realizing that animal welfare and employee satisfaction can have a positive economic benefit.

In summary, it is imperative that the swine industry in North Carolina receives immediate help in the area of animal welfare with an emphasis on on-farm euthanasia methods. Both

consumer and employee perceptions regarding euthanasia can have an economic impact on the industry through buying choices and employee turnover. This research project is a step in the right direction for an industry in need. This research could also open the door for other similar research in sensitive areas such as consumer reactions to euthanasia methods and other animal welfare issues.

CHAPTER 2.

CONCEPTUAL FOUNDATIONS AND LITERATURE REVIEW

Chapter 2 consists of the conceptual framework and the literature review. The first segment of this chapter reviews the literature related to the subject areas. The second segment discusses the conceptual framework of the study. The conceptual framework consists of two main areas. The first area deals with socio-demographic factors, socio-psychological factors, farm factors and euthanasia methods. The second area of the framework is associated with how the socio-demographic factors, socio-psychological factors, farm factors, and euthanasia methods relate to the attitudes of the workers toward euthanasia and their willingness to euthanize pigs.

History of Euthanasia

Brewer (1982)

The history of an issue is important when evaluating current processes and procedures. Brewer (1982) presented the following information at the 32nd annual meeting of the American Association for Laboratory Animal Science. The literature review of this project suggests there is a long history of pet and laboratory euthanasia; but very little information exists about farm animal euthanasia. Robinson's study (as cited in Brewer, 1982) stated that Paracelsus was

the first person to experiment with ether as a pain reliever. Brewer (1982) quotes Paracelsus in the early 16th century: "the use of ether in diseases which need to be treated with analyses...quiets all suffering without any harm, and relieves all pains" (p.18). The first recorded use of nitrous oxide as a euthanizing agent was recorded by Humphrey Davy in 1800 (Davy, 1800). Research completed by Barton (1808) suggests that James Woodhouse, a professor of chemistry at the University of Pennsylvania, completed experiments using nitrous oxide and carbon dioxide as euthanizing agents. Woodhouse concluded that carbon dioxide could be used as an anesthetic.

Brewer (1982) stated that the first report of animal euthanasia or humane killing without relation to anesthetic overdose or chemical toxicity was published in 1933. Brewer could find only 12 references to animal euthanasia between 1933 to 1949 dealing with other euthanasia techniques.

The use of hypoxia as a euthanasia method dates back to the early 1800's, when Woodhouse conducted his experiments. Haldane study (as cited in Brewer, 1982, p.1) states, "that there was no essential differences between carbon monoxide poisoning and oxygen removal in 1895." Brewer (1982) suggests that this opinion still lingers, but the experimental community realizes there is a distinct and important difference between oxygen deprivation and carbon monoxide poisoning. The pigs' muscle contractions appear to be more noticeable when euthanizing by using oxygen deprivation.

The perceived pain level of animals has been of interest to animal handlers for years. Brewer (1982) concluded that Claude Bernard in 1875 was the first person to recognize how an anesthetic affects an animal during the euthanasia process. Braezile (as cited in Brewer, 1982, p.1) stated, "there is evidence of differences in pain perception between humans and animals, but the known differences are primarily in conduction pathways, not in sensitivity to pain/pain receptors."

This brief history of animal euthanasia raises several issues that will be discussed in greater detail in this research project.

The facts established by the history summary include the following: Brewer (1982)

- 1) There was not much research completed in the area of animal euthanasia before 1945.
- 2) There are many different views on the amount of pain felt by different species of animals during euthanasia.
- 3) The relationship between the method of euthanasia and the amount of animal suffering is not completely understood.

Literature Review of Psychological Types
Keirsey (1998)

The idea of determining a person's psychological type has been around for many years. Finding the correct instrument to determine a person's psychological type is a difficult task.

The validity and reliability of an instrument is important. Keirsey makes several statements in his book Please Understand Me II about validity and reliability.

According to Keirsey (2003), validity is a problem to establish with any psychological instrument, and he goes so far as to say that "statistical validation for personality instruments are virtually meaningless" (p.1). Keirsey emphasizes that all sorters are not "tests" per se, so a validity statistic would not make much sense.

Keirsey (2003) states, "In terms of reliability, sorters are as 'reliable' as the MBTI, which is pretty good for a self-assessed personality questionnaire. They are pretty reliable. Reliability and validity are partially a function of temperament, which is predicted by the theory" (p.2).

Harbour (1997) recognized that the Myers-Briggs Type Indicator and the Keirsey Temperament Sorter were reliable in predicting a person's behavior. Keirsey (2003) suggests the Keirsey Temperament Sorter yields similar results to the Myers-Briggs Type Indicator. Keirsey indicates the correlation between the two indicators, the MBTI and the Keirsey Temperament II, is .75.

The backbone of the Myers-Briggs Type Indicator is ultimately Carl Jung's theory of personality types. Jung felt that his personality theory described general personality features rather than individuals as a whole (Kroeger, 1992). This understanding of personality typing helps clarify the lack of instrument validity.

Jung's four psychological functions include thinking, feeling, sensation, and intuition. The Myers-Briggs Indicator emerged from Jung's theory. Since the development of the Myers-Briggs Indicator, millions of people have taken the instrument (Keirsey 1998).

The Myer-Briggs Type Indicator is designed to identify sixteen patterns of action and attitude (Keirsey 1998). The table below lists the meaning of the sixteen letters.

What the Myers-Briggs letters mean (Keirsey, 1998, p.12):

E = Extraverted	/	Expressive
S = Sensory	/	Observant
T = Thinking	/	Tough-minded
J = Judging	/	Scheduling
I = Introverted	/	Reserved
N = Intuitive	/	Introspective
F = Feeling	/	Friendly
P = Perceiving	/	Probing

From the letter combinations, Myers developed the 16 personality types. The sixteen types are divided into four separate personality groups. The four groups include (Keirsey, 1998, p.11):

SP's	SJ's	NF's	NT's
ESTP	ESTJ	ENFJ	ENTJ
ISTP	ISTJ	INFJ	INTJ
ESFP	ESFJ	ENFP	ENTP
ISFP	ISFJ	INFP	INTP

Keirsey (1998) states, "the four groups of personality types described by Myers corresponded nicely with the four personality types of several predecessors, especially those of Eric Adickes, Eduad Spänger, Ernst Kretshmr, and Eric Fromm, all of which could be traced back to the ideas of Plato, Aristotle, and Galen" (p.15).

The percentage of each of the personality types in the general population is demonstrated in Chart A (Moreira, 2003,p.2).

Introvert									
Sensing	ISTJ	6%	ISFJ	6%	INFJ	1%	INTJ	1%	Intuition
	ISTP	6%	ISFP	6%	INFP	1%	INTP	1%	
	ESTP	13%	ESFP	13%	ENFP	5%	ENTP	5%	
	ESTJ	13%	ESFJ	13%	ENFJ	5%	ENTJ	5%	
Extrovert									

Chart A: Myers-Briggs Type Indicator and The General Population

The following Chart B is a combination of the 16 Myers-Briggs personality types into the four temperament groups.

Sensing / Perceiving	SP	38%
Sensing / Judging	SJ	38%
Intuition / Feeling	NF	12%
Intuition / Thinking	NT	12%

Chart B: Myers-Briggs Temperament Group General Population Distribution

According to the Myers-Briggs Type Indicator (chart B), there are equal amounts of people in the general population that represent the two groups sensing / perceiving (38%) and sensing / judging (38%).

The next two groups, intuition / feeling and intuition / thinking, are equally represented with 12% of the general population in each of these groups.

Keirsey (1998) defines temperament as a configuration of inclinations and makes the analogy that "our brain is a sort of computer which has temperament for its hardware and character for its software" (p.20). Keirsey (1998) states, "temperament is a configuration of inclinations, while character is a configuration of habits" (p.20).

Keirsey (1998) concludes that the characteristics of the four temperaments are consistent over time; he believes the four types are most likely derived from a combination of life's two most basic human actions, how people communicate with each other and how people use tools to accomplish their goals. Humans are set apart from other animals by the way humans use words and tools (Keirsey, 1998).

Keirsey suggests that the great majority of the population is predominantly "concrete" in our word usage and the rest of the population is divided in their use of tools. Keirsey suggest that about half of the population is utilitarian in their choice of tools and the other half cooperative.

Chart C illustrates Keirsey's abstract and concrete word usage combinations. By observing a person's word usage, they can be categorized as abstract or concrete.

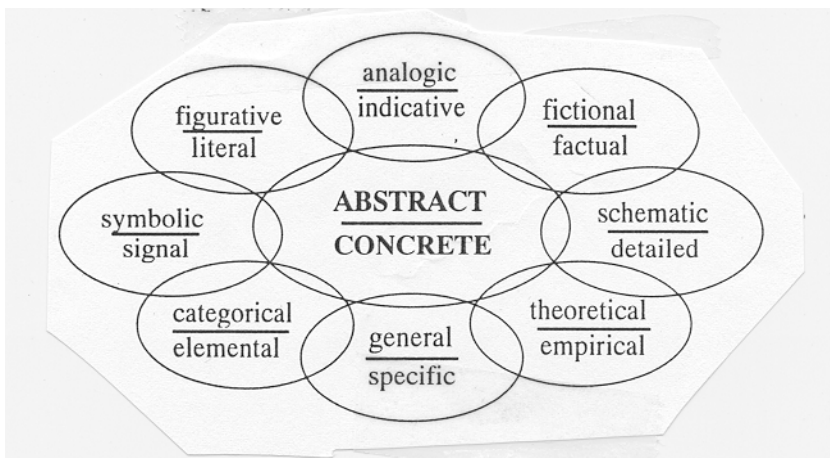


Chart C: Abstract / Concrete Word Usage
(Keirsey, 1998, p.27)

The next area that Keirsey considers important in determining a person's temperament is the utilization of tools that make them effective in society. Keirsey (1998) suggests Cooperators try to get where they want to go by getting along with others and by following all rules and regulations. The Utilitarians decide how to get what they want in the most effective way. Utilitarians choose the tools they need to succeed with the least cost and effort. Utilitarians are not interested in following the rules if it means slowing down the process.

The four-cell matrix (Chart D) illustrates the tool and word usage to explain the four temperaments.

		<u>Words</u>	
		Abstract	Concrete
Cooperative		Abstract	Concrete
		NF	SJ
<u>Tools</u>		Cooperator	Cooperator
		Abstract	Concrete
Utilitarian		NT	SP
		Utilitarian	Utilitarian

Chart D: Keirsey's Four-cell Matrix

Keirsey uses what can be observed, words and tools, to define different temperaments. Keirsey (1998) examines the differences between the Myers-Briggs Type Indicator and the Keirsey Temperament Sorter. The Myers-Briggs instrument is influenced by the purely hypothetical notion that there are four "psychological functions": "sensation," "intuition," "feeling," and "thinking." Keirsey (1998) states, "I have never found a use for Jung's scheme of psychological functions, and this is because function typology sets out to define different people's mental make-up—what's in their

heads—something which is not observable, and which is thus unavailable, subjective, a matter of speculation and occasionally of projection” (p.30).

Keirsey (1998) states, “to take some of the guesswork out of temperament theory, I base my type definitions on what people do well, their skilled actions—what I call their ‘intelligent roles’—which are observable, and which thus can be defined more objectively” (p.30).

Keirsey (2003) suggests even though his methods of obtaining temperaments are different than Myers’ methods, the correlation factor is .75 (p.1).

Information supplied by Keirsey on the website www.keirsey.com implies the temperaments, SJ, SP, NF, and NT are represented by the following percentages in the general U.S. population. The percentages can also be compared to the Myers-Briggs general population percentage presented earlier in the document. (p.2)

Groups		Percentages
Artisans	SP	35-40%
Guardians	SJ	40-45%
Idealists	NF	5-10%
Rationales	NT	5-10%

Chart E: Keirsey’s Estimate of Temperament Percentages in the General Population (p.2)

Yeske's (1997) study on swine production workers personality types concluded that personality profiles can be a valuable tool to help decision makers with self improvement and to help understand how they make decisions. Yeske (1997) suggests that by understanding a farm workers personality type, you can present information in a more usable fashion. Research completed in Quebec by Ravel et al. (1996) has shown that the personality profiles of swine workers in Quebec is different than the general public. A detailed explanation of Yeske's and Ravel's research is discussed in the literature review.

2000 Report of the AVMA Panel on Euthanasia

The purpose of the research by the AVMA is to review and make necessary revisions to the methods of euthanasia of domestic and wild animals. The panel uses current available scientific information to make decisions on proper euthanasia methods.

The panel of distinguished veterinarians (AVMA,2000) states, "The panel's overriding commitment is to give veterinarians guidance in relieving pain and suffering of animals that are to be euthanized. The recommendations in this report are intended to serve as guidelines for veterinarians who must then use professional judgment in applying them to various settings where animals are to be euthanized" (p.672).

The question posed by this study is: What are appropriate euthanasia techniques for pigs, and how should they be administered? Any study of euthanasia centers around the definition of the term. The article defines euthanasia as a "good death"... The term is derived from the Greek term eu, meaning good, and thanatos, meaning death. A good death should occur with minimal pain and distress. (p.672)

The panel chose these general considerations for evaluating euthanasia: (p.673)

1. Ability to induce loss of consciousness and death without causing pain, distress, anxiety, or apprehension
2. Time required for inducing loss of consciousness
3. Reliability
4. Safety of personnel
5. Irreversibility
6. Compatibility with requirement and purpose
7. Emotional effects on observers or operators
8. Compatibility with subsequent evaluation, examination, or use of tissue
9. Drug availability and human abuse potential
10. Compatibility with species, age, and health status
11. Ability to maintain equipment in proper working order

12. Safety for predators/scavengers should the carcass be consumed

The study distinguished three basic mechanisms for animal euthanasia:

1. Hypoxia
2. Direct depression of neurons necessary for life function
3. Physical disruption of brain activity and destruction of neurons necessary for life.

Most of the swine farms use physical methods to euthanize animals. These methods include captive bolt, gunshot, blunt trauma and cervical dislocation. There are other prescribed methods available, but due to safety issues and training of personal, they are not available for farm personnel. Many people consider the physical methods of euthanasia to be aesthetically displeasing. The panel of AVMA authors (2000) agrees, euthanasia methods that are most humane are not perceived as aesthetic and create conflict. Personnel performing the physical methods must be well trained and monitored for each type of physical technique.

Another prescribed method of farm euthanasia is inhalant agents. The AVMA (2000) authors state, "The suitability of a particular agent depends on whether an animal experiences distress between the time it begins to inhale the agent and the time it loses consciousness" (p.675). Carbon dioxide (CO₂) has been used to euthanize swine successfully. In a brief study, AVMA (2000) found that a high percentage of CO₂

produced a stressful effect on the animals being euthanized, but a 30% solution did not show any harmful side effects. The research states the following as advantages of CO₂ euthanasia:

1. Rapidly depresses brain function
2. CO₂ is readily available
3. CO₂ is inexpensive, nonflammable, non explosive and poses minimal hazard to personnel when used properly by designed equipment
4. CO₂ does not result in accumulation of tissue residues in food producing animals
5. Carbon dioxide euthanasia does not distort murine cholinergic markers or corticosterone concentrations.

There are advantages and disadvantages to any type of euthanasia procedure. The two procedures examined in this research, physical and inhalant, are very different. Both of the procedures are examined in this research from the standpoint of employee acceptance. One of the questions asked is, if both of the procedures are approved and prescribed by the AVMA, and the measures of acceptance are equal, what reasoning prohibits the employee completing the task from making the decision on which method of euthanasia to use? Should companies allow employees to chose the method of euthanasia they are more comfortable with, or should they follow company policy?

The research project explores employees' reactions to the differences in physical and CO₂ euthanasia and determines

which method of euthanasia appears to be easier and more comfortable for swine workers to perform.

Emotional Response of Animal Shelter Workers to
Euthanasia

White and Shawhan (1996)

The literature related to farm workers and their emotional responses to euthanasia is limited, but White and Shawhan (1996) completed the following research on the emotional response of animal shelter workers to euthanasia. Employees of the 5,000 animal shelters across the nation are faced with the task of euthanizing approximately 8 million unwanted dogs and cats. Ellis's study (as cited in White, Shawhan, 1996) states, "Such employees may face serious mental health issues, in particular depression, unresolved grief, anger and nightmares" (p.846). White, Shawhan (1996) state, "The purpose of the surveys reported here were to give veterinarians and mental health workers insight into the stressful nature of animal shelter work and to help these professionals to provide mental health services to shelter workers" (p.846).

Euthanizing unhealthy animals is a problem, but euthanasizing 39,000 healthy animals per day in the United States create special problems for the workers.

Letters were sent to 162 animal shelters in the United States to solicit their willingness to participate in the

survey. Positive responses were received from 86 shelters, this involved 618 animal shelter employees. All demographic information was obtained by two questionnaires sent to the shelters. All employees were asked to describe their feelings and thoughts about euthanasia in essay format.

The research revealed the following results:

1. High turnover rates were a problem
2. Only 3 employees indicated psychological counseling
3. Twenty employees participate in an ongoing support group
4. Thirty-two employees said they had participated in workshops and seminars dealing with euthanasia

White and Shawhan (1996) state, "95% of the shelters that responded use an injection of sodium pentobarbital and 5% of the shelters indicated that they euthanized unwanted animals in carbon monoxide gas chambers" (p.847).

One of the interesting aspects of this survey was the written response of the shelter employees. It is evident from the responses of the employees that emotional problems exist if euthanasia of animals is a part of one's daily routine.

Listed below are the responses of some of the animal shelter employees when asked how they feel about euthanasia (p.847-849).

- "I love taking care of animals, and it breaks my heart to feed them, take care of their

medical needs, only to have to turn around and euthanize them."

- "It bothers me to decide to kill an animal because it is a black dog and we have 3 black dogs waiting for homes."
- "Some days I hate myself for being a part of it."
- "I have a lot of sleepless nights, a lot of crying."
- "I sometimes go home thinking I am a murderer."

The research was quick to reveal that some workers did not have a problem with euthanasia. One worker said, "I have no feelings about euthanasia. It doesn't bother me" (p.848). Many of the workers block feelings about euthanasia by not getting personally involved with the animals.

It is very clear from this research that many animal shelter employees experience considerable emotional problems from the process of animal euthanasia on the job. If animal shelter employees have problems performing their duties, then it is likely that any employees involved in the care of animals experience some degree of emotional anguish when they have to euthanize animals.

Euthanasia of Rats with Carbon Dioxide—Animal Welfare
Aspects

Hackbarth, Kuppers and Bohnet (1999)

Euthanasia of pigs using carbon dioxide is an approved practice by the AVMA and the AASP. According to existing company protocols Appendix I, this method is not currently used by the research population on 1 to 12 pound pigs. The use and acceptance of this approved method is an integral part of this study. The research completed using other species of animals is important in determining the feasibility in the target species. Euthanasia of small animals in a laboratory setting with CO₂ is a common practice. This research deals with the animal welfare aspect of CO₂ euthanasia. The question asked in this research compares the differences between different amounts of CO₂ and oxygen to animal behavior. Rats euthanized with CO₂ are compared with rats that are sedated before being euthanized. The research looked for rats showing any distress or pain during CO₂ euthanasia.

All animals were treated equally during the experimental process. All animals were given separate houses, soft wood bedding, same temperature and diet. All animals were handled the same amount of time each day to reduce the fear and stress related to human contact. Strict scientific procedures were followed. The rats' behavior was assessed during the euthanasia process. The following areas were assessed:

- Eyes

- Respiration
- Overall appearance
- Defecation
- Urination
- Abnormal activity
- The bearing, locomotion and vocalization were recorded

According to the research, there were no signs of abnormal behavior. There were no signs of animal pain or fear. Hackbarth (2000) states, "the main point for the recommendation of a method of euthanasia should be that the animal has not suffered pain, distress or even discomfort, along with any assurance that the method is not allowed to interfere with the experimental results" (p.95).

Hackbarth (2000) confirms that "as there were no differences between the sedated and the nonsedated rats or between the anaesthetized and the conscious rats, it can be assumed that the described euthanasia with CO₂ is in concordance with animal welfare as it is rapid and does not cause distress in the animal and therefore can be recommended as 'humane'" (p.95).

One of the key factors to a successful euthanasia process is a painless death. No matter what the method used to euthanize, it must be painless and quick to be accepted by society. Even though CO₂ euthanasia may appear to be less traumatic for the employee performing the act, it must first be considered painless to the pig. If CO₂ euthanasia is

considered humane, then a similar procedure prescribed for pigs could be considered humane for pig euthanasia.

In the proposed study of pig euthanasia methods, employees were asked to choose the method they perceive to be more comfortable for them to perform from a physical and emotional standpoint. If the CO₂ method is chosen by employees and deemed humane, then the swine industry could change the industry standard to improve animal welfare needs and human emotions.

Psychodemographic Profile of Stockpeople Working on
Independent and Integrated Swine Breeding Farms in Quebec
Ravel, A., D'Allaie, S., Bigras-Poulin, M., & Ward, R. (1996)

This Canadian study attempts to determine the relationship of psychological profiles of swine workers and management practices. This is one of the few articles written on the psychological profiles of swine workers. The results of Ravel, et al. (1996), can be compared to the personality profiles of swine workers participating in survey.

An underlying assumption made by the researchers based on their previous research, is that the positive or negative treatment of swine by stockpersons affects the overall production of the animals.

The questions addressed in this research include:

1. Is there a typical psychological and/or demographic profile of pig stockperson?

2. Are there differences in the profiles of persons working in independent vs. corporate farms?
3. Is there a difference in personality profile of the pig stockperson vs. average French-Canadian population?

The central question reviewed by the cross-sectional study is narrowed to the relationship between the stockperson's personality and management practices in farrowing quarters. The hypothesis presented by the author relates to the way in which the differences in personality of the caretaker reflect differences in working conditions regarding interaction and human relations in corporate cultures of farming organizations.

Another way to explain the authors' intent is: can the personality of the stockperson (the one who feeds, watches over, manipulates, treats and controls the animal's environment) affect the production of the animal based on differences in treatment? The hypothesis proposed by the author is testable. There are established techniques and measurement instruments available that can provide reliable data on swine employee personalities. Once the personality profiles of the employees have been established then accurate production records can be utilized to empirically check the soundness of the hypothesis.

The methodology used for sampling was different for both independent and vertically integrated farm groups. Random

selection was used in selecting the forty-eight independent farms. The integrated farms were not randomly selected; all thirty-eight farms in the designated area were chosen for the sample. This convenience sample method included all eligible farms in the four vertically integrated organizations represented in the sample area.

After the farms were selected from the population, the farms were called and asked for their willingness to participate in the study. After agreeing to participate, the farms were visited once to obtain the necessary demographic information. This information was obtained using a face-to-face interview with each employee. A questionnaire using open-ended questions was designed and tested on four pig producers before being used in the study. The demographic information obtained during the interview included:

1. Age
2. Experience
3. Seniority
4. Educational Level

The methodology used to obtain the personality profile of the employees was a French Canadian translation of Form A of the Sixteen-Personality Factor Questionnaire (16 P. F) published by the Recherches Psychologiques Inc. This instrument was chosen for its strong reliability, validity and its ability to draw a general but complete psychological profile on an employee. This profile was also chosen due to

its simplicity: anyone can take it who is able to read a newspaper and complete a questionnaire.

When the author compared the personality profile of swine industry stockpersons with the French-Canadian population, this important discovery was made. Ravel et al., (1996) states, "The personality profiles of the independent stockperson and employees of organization were comparable in great part and differed from the French-Canadian population as a whole for 6 primary factors and the 2 secondary factors considered. This suggests the existence of a specific personality profile related to pig stock people" (p.246).

In this study, the stock people scored high on emotional stability, conformity, self-discipline, and introversion. According to the personality profile analysis, scoring high on these traits would characterize the pig stockperson as being reserved, serious, unsentimental, not anxious, emotionally stable, conscientious, controlled, and introverted.

Ravel et al. (1996) states, "Many of these traits may well fit the type of work involved in pig production" (p.247).

When hiring stockpersons and training them for jobs in the swine industry, it would be very helpful to place them in a job where they were comfortable. Correct placement equates to a more satisfied employee and less employee turnover. A better understanding of an employee's personality could help in job placement. Ravel et al. states, "The parallel description of the independent stockpersons and of those

working for organizations tends to show a common psychological profile that may be related to the type of work" (p.247).

If there is a difference between the personality profile of a swine stockperson and the average Canadian, then there could be a difference within personality profiles of people performing various tasks as a stockperson.

There is an indirect relationship between this study and the proposed euthanasia research project. Do employees with a certain personality profile respond differently to methods of euthanasia?

Observations on the Trajectory of the Bullet in 15 Horses
Euthanized by Free Bullet
Millar, G., & Miles, D. (2000)

There are many different physical methods to euthanize an animal. Two methods prescribed by the American Association of Swine Practitioners and the National Pork Board are blunt trauma and gunshot. One question prevails in the discussion of these two euthanasia methods: how accurate are they in producing a quick and painless death? The purpose of this study is to determine if the gunshot is an acceptable method of euthanasia in equiries. Millar et al., (2000) states, "many consider death by the gun to be quick, humane and effective. However, there has been remarkably little scientific investigation of this claim in the horse" (p.754). For the

euthanasia process to be considered successful, the bullet must render the horse insensitive immediately, with little or no suffering. Studies have been completed on the type and size of the projectile to put a horse down humanely, but the trajectory of the bullet has not been studied. Possibly the size and the type of bullet used to euthanize a horse might be insignificant compared to the trajectory of the projectile leaving the gun. The trajectory of the bullet may have the largest effect on a quick and painless death.

Millar's study involved the euthanasia of 15 horses. The same person euthanized all of the horses on the same day, using the same equipment. Unique techniques were used to measure the trajectory of the bullet to determine if the destruction of the brainstem was achieved. A group of veterinary surgeons developed a scoring system for the extent of destruction of each horse's brainstem.

The placement of the gun and the entry point of the bullet deviated very little between animals. Due to the angle of entry, or position of the gun on the forehead of each animal, the damage to the brainstem of each horse was different. Only five of the horses' brainstems had clear extensive damage that could contribute to a quick and painless death. Six of the fifteen bullets totally missed the brainstem. Destruction of the brainstem is important for successful euthanasia. Millar et al., (2000) states in conclusion, "it is important that those involved in the slaughter of horses with a free bullet should pay close

attention not only to the surface position of the weapon but also to the projected trajectory of the bullet, in order to reduce the suffering of the horse as far as practicable" (p.756).

The swine industry uses several prescribed methods of head trauma to induce euthanasia on animals. The three methods most commonly used are the captive bolt gun, rifle, and blunt trauma. Since this research suggests the gunshot method of euthanasia on horses is so unpredictable, it is possible that the head trauma methods listed above are just as unpredictable in the euthanasia of swine. The proposed euthanasia project reviews different methods of euthanasia with regards to employee acceptance. The two distinct methods demonstrated by the project are carbon dioxide gas and head trauma.

Personality Type, Attitude Towards Pigs, and Herd
Productivity, Paul E. Yeske (1997)

The size and number of swine farms in North Carolina will not change much in the future due to a state moratorium on swine expansion. Yeske (1997) state, "as the swine industry continues to go through a dramatically changing period farms are changing in size and adding more employees and producers are viewing their farms as business units" (p.80). Farm owners are continually looking for ways to improve employee relations and farm production. McGlone and Pond (2003) states, "retention of employees has become a major problem, especially

in large-scale pork production" (p.347). An understanding of one's personality could be helpful in reducing the turnover rate and improving production by creating a better team operation.

Yeske (1997) states, "by understanding an individual's personality profile, we can more effectively communicate to that person" (p.180). Yeske referred to research completed in Quebec dealing with farm employee personality profiles and research completed by Dr. Flowers at North Carolina State University dealing with stockperson's behavior and increased production. Both of these studies referred to increased production through better understanding of animals and employee personality.

Yeske's (1997) research used the Myers-Briggs personality indicator to determine the personality of swine workers. The study concluded there are two very predominate personality profile types—ISTJ and ESTJ—on swine farms. The results suggested that swine employees with personality types ISTJ and ESTJ produced more pigs than other personality types. A combination of these two personality types equaled a majority (61.5 percent) of the swine workers surveyed. According to Yeske (1997), the ISTJ profile types are organized, dependable and responsible, thus fitting the role of a manager. The ESTJ personality types are outgoing, productive, and very upbeat to be around. They see things around them in terms of hands on, practical and realistic. Yeske (1997) states, "the results show that 20% of the surveyed decision makers are in this type

and are well suited for their roles in managing their production systems" (p.182).

The results of Yeske's study and the personality profiles of swine workers are discussed later in the study.

An Assessment of Carbon Dioxide Stunning in Pigs

N. C. Gregory, B. W. Moss & R. H. Leeson

This study deals with the effects of carbon dioxide stunning in pigs. Gregory, Leeson and Moss (1987) measured the abnormal vocalization of pigs during CO₂ euthanasia. Gregory et al. (1987) reports, "none of the pigs showed any voluntary movement that resembled conscious activity, nor any spontaneous rhythmic respiration, but 75 percent of the pigs showed gagging, indicating that a degree of brain stem function was still present" (p.517). Gregory (1987) suggests "that an average narcosis began 30 to 39 seconds after the start of immersion in a compact stunning unit containing 86 percent carbon dioxide in air at the basic of the well" (p.518).

Gregory et al. concluded that the carbon dioxide gas properly stunned the pigs, but a majority of the pigs were not considered brain dead after the euthanasia process.

One important question associated with this project involves the method of euthanasia used and the perceived level of pain felt by the pig. According to the definition of euthanasia, is the gagging process observed by Gregory (1997)

considered a painful response to the carbon dioxide gas euthanasia process? How does the swine stockperson view this reaction?

Clinical Recognition and Anticipation of Situations Likely to
Induce Suffering in Animals

Spinelli, J. & Markowitz, H. (1997)

The research completed by Spinelli, J. & Markowitz, H. (1997) deals with the question of whether animals feel pain during the euthanasia process. If they feel pain during the process, what determines the pain threshold for the pig?

The concept of pain, coupled with the inability of the animal to communicate an unpleasant sensory and/or emotional experience, leaves workers with a dilemma in the swine husbandry business. Swine workers and scientists must determine which euthanasia technique is the quickest and least painful for the pig.

Spinelli et al. (1987) states, "pain and or discomfort cause suffering only when pain and/or distress is at a degree that an individual animal can not tolerate. The ability to tolerate pain or discomfort will vary widely from one individual to another and even within a given individual from time to time" (p.1216).

Spinelli recognizes emotional pain as an unpleasant perception in response to external or internal stimuli that results in a state similar to anxiety or frustration. Parts of

the swine euthanasia process could create varying degrees of anxiety, frustration or discomfort. Spinelli suggests it is difficult to discriminate between tolerable and intolerable degrees of pain. The most accurate reflection of pain in animals is their immediate behavior during the process. Spinelli suggests crying sounds can be a sign of pain in animals. The vocal noise and muscular contractions exhibited by a dying pig could create an unpleasant feeling in some swine employees.

Uneasiness Among Laboratory Technicians

Arluke, A (1990)

Trapped in a Guilty Cage

Arluke, A (1992)

These two studies deal with swine employees' attitudes toward euthanasia. Dr. Arnold Arluke completed extensive research on animal caretakers in animal research facilities and the attitude they have toward their work. Arluke (1992) states, "one feature of the animal research staff perspective is uneasiness. Uneasiness may be a causative factor in staff turnover, psychosomatic disability and lowered work performance" (p.21). Arluke's research suggests that the depth of animal attachment in the laboratory environment has an effect on the amount of employee uneasiness. One of the laboratory technicians interviewed by Arluke expressed his or her feelings as "you have to be able to be kind, considerate,

and have a relationship with the animal and at the same time be able to separate yourself as quick as possible" (p.24). Arluke found this response to be recurring among technicians: "the more you do it, the more used you get to it. It doesn't seem to bother you as much. I just keep telling myself it's a job" (p.26).

Arluke (1992) found that few technicians had frequent signs of depression or anxiety such as nightmares, sleepless, and increased alcohol consumption that they attributed to working with animals. Arluke's technician interviews suggest that the respondents prefer the term "uneasiness" to using "stressful" as a descriptive term describing their feeling toward euthanasia.

When dealing with euthanasia, Arluke found more experienced technicians almost never pushed newcomers to kill and waited until they seemed ready to euthanize. Arluke (1992) suggests that the novice technician seldom accepted euthanasia by slamming animals to induce blunt trauma. Many of the technicians cope by viewing euthanasia as a daily ritual. In some cases, the technician would say a prayer before euthanizing an animal.

The research conducted by Arluke reveals a degree of uneasiness among many laboratory technicians who euthanize large number of animals.

The research laboratory setting is similar to swine production facilities. Each of the jobs deals with long-term animal care and nurturing. Both groups of employees perform

euthanasia as part of their job. This research project explores the emotional responses to euthanasia experienced by swine employees in eastern North Carolina.

Conceptual/Theoretical Framework

The conceptual framework for this study is primarily derived from the culmination of information gained from focus group interaction and previous research in related areas of animal euthanasia. Research in the area of swine euthanasia is limited. Information gleaned from related research was instrumental in designing this project. Theories related to animal euthanasia and human perceptions are presented. Theories related to animal euthanasia and prescribed methods of animal euthanasia are used in the study.

The two dependent variables used in this research project include the attitude of employees toward euthanasia and their willingness to perform euthanasia. Four independent factors consisting of several independent variables each are researched in this project. The independent factors include the socio-demographic factors, the socio-psychological factors, the farm factors, and the euthanasia method. Each one of the independent variables is discussed in detail during the analysis section of this project.

The first factor involves the socio-demographic factors of the employees working on the farm. The socio-demographic independent variables include the ethnic origin, gender,

education level, age, and preferred language used by the employee.

Socio-psychological factors associated with the study include the temperament of the employee, the employee's psychological type and stress-related factors. The temperament and psychological types of the employees are evaluated using the Keirsey Temperament Sorter II.

Farm factors were used to determine what is currently happening on the farm. The independent variables associated with farm factors include the area where the employee is currently working, where they have worked in the past, who administered training and the weight of pigs being euthanized.

The euthanasia method is the fourth factor researched. The analysis of the euthanasia method includes the following independent variables: which method of euthanasia does the employee perceive to be the safest, which method is perceived by the employee to be the best method for the pig, does the physical damage caused by the euthanasia method create a problem, is the method currently used by the employee considered to be the best method, and does the speed of the process have an effect on an employee's willingness and attitude to perform euthanasia?

One of the reasons for the research project is to possibly improve the welfare of animals during the euthanasia process and the emotional well-being of the employees who have to euthanize them.

Human perception is extremely important in all aspects of animal production. According to McGlone (2000), "consumers' ethical values are beginning to influence international trade as well as domestic purchasing decisions" (p.15). There are explicit boundaries that the public will accept with regards to animal welfare, although these boundaries vary among individuals. This is evident by the various levels of animal welfare activist activity and the extent to which they are willing to go to relay a message (PETA, 2004).

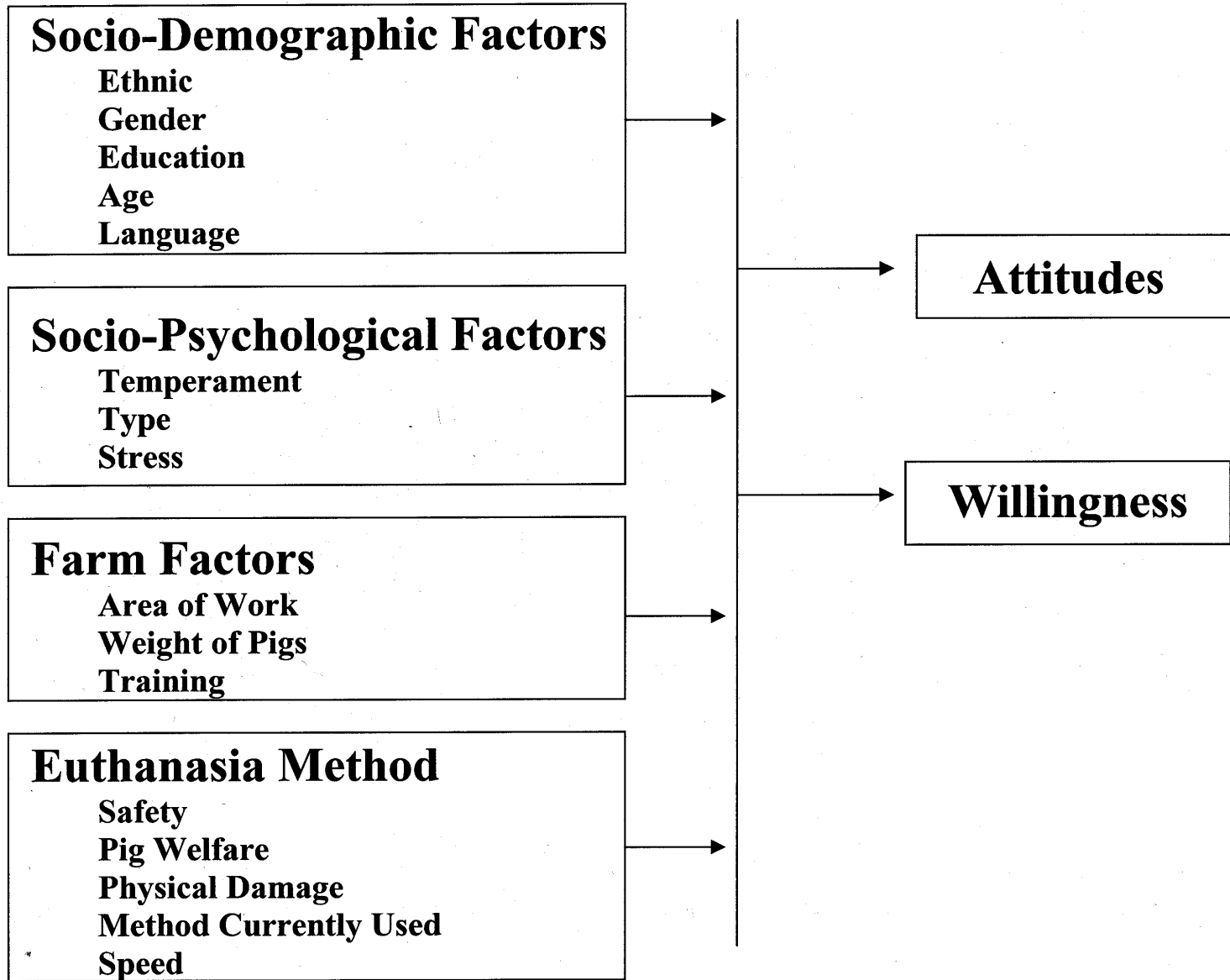
The research explores human emotion related to euthanasia as a viable factor in determining a satisfactory euthanasia process. A properly prepared survey instrument can help quantify this factor, although it is possibly one of the hardest factors to determine in the research project. Reliability and validity of the instrument in this context are crucial. Approximately 400 employees completed the survey in an attempt to validate the research. A quality instrument accepted by the livestock industry is important to the future use of this research information.

Four primary areas of concern for this research include socio-demographic factors, socio-psychological factors, farm factors and euthanasia method. The intent of the author of this research that the information obtained can be used by the swine industry as a tool in determining the correct euthanasia procedure for farm use.

The framework for this study was constructed by using the following objectives:

1. Which method of euthanasia, blunt trauma, electrocution, lethal injection, bolt gun, rifle or carbon dioxide gas, do employees prefer?
2. Does the employee perceive the pain of the pig an important factor when choosing a euthanasia method?
3. Do employees perceive safety as an important factor in performing euthanasia?
4. Which method of euthanasia, blunt trauma or carbon dioxide gas, do employees perceive as being the fastest method of euthanasia for the pig?
5. What method of euthanasia training do employees prefer?
6. Do employees perceive the time it takes to complete the euthanasia process as an important factor in choosing a method?
7. Do employees perceive the euthanasia of pigs as a stressful part of the job?
8. Is there a correlation between employees' temperaments and his or her willingness to euthanize pigs and his or her attitudes toward euthanizing?
9. Do selected socio-demographic factors influence an employee's attitude toward euthanasia and/or willingness to euthanize pigs?
10. Selected socio-psychological factors do have an effect on an employee's attitude and/or willingness to euthanize.

11. Do selected farm factors influence an employee's attitude toward euthanasia and/or willingness to euthanize pigs?
12. Do selected euthanasia methods influence an employee's attitude toward euthanasia and/or willingness to euthanize pigs?
13. Does a combination of independent variables in the multivariate model influence an employee's attitude toward euthanasia and/or willingness to euthanize pigs?



CHAPTER 3.

METHODOLOGY

The purpose of this research was to determine which procedure or combination of events constituting a euthanasia method would be considered most acceptable to the swine employees in eastern North Carolina. The study also helps determine which method of euthanasia is perceived safest for the employee and most humane for the pig. Personality profiles of the survey population are also determined. The details related to select demographic variables are studied in relation to personality, attitude toward euthanasia and willingness to perform euthanasia on the farm.

Research Questions

Stated below are the research questions that were selected from the focus group activities.

1. Which method of euthanasia, blunt trauma, electrocution, lethal injection, bolt gun, rifle or carbon dioxide gas, do employees prefer?
2. Does the employee perceive the pain of the pig an important factor when choosing a euthanasia method?
3. Do employees perceive safety as an important factor in performing euthanasia?

4. Which method of euthanasia, blunt trauma or carbon dioxide gas, do employees perceive as being the fastest method of euthanasia for the pig?
5. What method of euthanasia training do employees prefer?
6. Do employees perceive the time it takes to complete the euthanasia process as an important factor in choosing a method?
7. Do employees perceive the euthanasia of pigs as a stressful part of the job?
8. Is there a correlation between an employee's temperament and his or her willingness to euthanize pigs or his or her attitude toward euthanizing?
9. Do selected socio-demographic factors influence an employee's attitude toward euthanasia and/or willingness to euthanize pigs?
10. Selected socio-psychological factors do have an effect on an employee's attitude and/or willingness to euthanize.
11. Do selected farm factors influence an employee's attitude toward euthanasia and/or willingness to euthanize pigs?
12. Do selected euthanasia methods influence an employee's attitude toward euthanasia and/or willingness to euthanize pigs?

13. Does a combination of independent variables in the multivariate model influence an employee's attitude toward euthanasia and/or willingness to euthanize pigs?

Research Design

The research design consists of two surveys. The euthanasia survey (Appendix D and E) consists of questions related to employee demographic information and questions concerning employees' attitudes toward swine euthanasia and willingness to euthanize. The questions used in this portion of the study were scrutinized and chosen by peer review process. The Keirsey Temperament Sorter II was used to obtain the personality profile of each swine employee. Both of the surveys were available to survey participants in their native language (Spanish and English). A bilingual production trainer for one of the major swine production companies translated the euthanasia survey, while the Keirsey Temperament Sorter was purchased already translated in Spanish. All of the surveys and farm visits were administrated on the job site by the author of the study. The same procedures were followed at each farm to help decrease bias or misrepresentation. The population sample was developed using a random systematic stratified sampling technique. Due to the complete cooperation of the farms, all of employees present on the day of the

presentation completed the surveys. Further details about the design and implementation of the study are discussed later in the study.

Population and Sample

The target population for this euthanasia study was comprised of employees that work on swine operations in North Carolina. The target population includes employees from large livestock company swine operations. The total target population includes employees from a wide variety of social, ethnic, economic and educational backgrounds. Due to the requirements placed on the employee participation regarding company policy and biosecurity measures, a modified random sampling technique was implemented.

The sample was comprised of employees that worked on commercial production farms. Genetic farms were not allowed to participate in the research due to the farms' biosecurity policies. The farms that were unable to participate in the study represented such a small number of employees that sample integrity was not jeopardized. The sample includes 388 swine farm employees who are involved or have been involved in euthanizing pigs.

Needs Assessment - (Focus Group)

Prior to the instrumentation process, three focus group activities were conducted to establish a basic understanding of euthanasia from an employee perspective and help develop the project framework and the euthanasia survey. Each focus group was made up of randomly selected employees working on swine farms. The selected focus group employees came from diverse socio-demographic backgrounds. Demographics regarding the focus groups are found in Appendix B. Each focus group reviewed the euthanasia videotape illustrating all of the prescribed methods of euthanasia by the AASP and the AVMA. After viewing the videotape, each group was asked specific questions about the euthanasia process as illustrated on the video. Each focus group was asked the same questions. All of the responses were recorded and used in the development of the euthanasia survey. A sample of the focus group questionnaire can be found in Appendix A.

Instrumentation

Two surveys were administered to each of the 388 employees in the sample population. Each of the surveys had two translations, English and Spanish. For accuracy, a bilingual employee with 10 years of experience in the swine industry produced the Spanish translation of the euthanasia survey. The publisher translated the temperament sorter.

Survey #1, the euthanasia survey (Appendix B), consisted of 53 questions dealing with demographic information, pig welfare, safety issues and attitudes about euthanasia methods. Prior to completing the survey, each group of employees viewed the same euthanasia video used in the focus groups. The euthanasia video was developed at North Carolina State University Swine Extension Specialists, by Dr. Morgan Morrow, to illustrate the correct procedures for euthanizing different sizes of pigs.

Survey #2, a temperament sorter developed by David Keirse, was administered to determine the temperament of each participant. The Keirse Temperament Sorter II (Appendix, E) consists of 70 forced-choice questions similar to the Myers-Briggs Personality Profile.

A tracking system for the two surveys was used so the results of the temperament sorter could be correlated to various dependent variables on the euthanasia survey. Complete participant verification was not necessary for the accuracy of this research.

Data Collection Procedure

Notification and Information Phase

Participating farm managers were notified in advance by the company production managers. The farm manager was instructed as to the importance of the survey, his role in informing farm participants about the accuracy of their answers, and factors involved in administering the survey. A

date and time was set for each farm visit. Due to biosecurity reasons, each of the farm units within a company was completed before moving to the next set of company farms.

Administering the Surveys

The survey was conducted by visiting each of the forty-seven randomly selected farms. The number of farm employees on each farm ranged from three to twenty-eight employees. The author of the study conducted each of the surveys to help eliminate any bias associated with delivery of the instruments.

Procedures for administering the surveys:

1. The importance of the survey was explained to the participants.
2. Participants viewed the euthanasia video.
3. Participants answered the euthanasia questionnaire.
4. Participants answered the Keirsey Temperament Sorter.
5. Participants' incentives were distributed.

Each of the participants works in an area where he or she performs euthanasia or has completed euthanasia procedures in the past. When necessary, a Spanish interpreter was available to answer questions about the video or the survey.

Explaining the Importance of the Survey

A detailed explanation was given to each group of participants about the importance of the survey and the importance of taking their time to answer all questions to the

best of their knowledge. The survey administrator gave a detailed explanation to each group of farm participants that their individual identification of the participants would not be used in any manner. It was stressed to each group that their supervisors approved the survey and the company wanted them to answer the questions in a very honest and unbiased manner. Due to sensitivity of the topic, company approval and support of the project was essential to the accuracy of the results.

Viewing the Euthanasia Video

The proper euthanasia procedures video produced by Dr. Morgan Morrow at North Carolina State University illustrates the proper methods of swine euthanasia at all stages of growth. The survey participants viewed all prescribed methods of farm euthanasia. All areas of swine euthanasia were introduced; they included pig welfare, employee safety, euthanasia techniques and approved protocol. Viewing the video reemphasizes the proper procedures of euthanasia and puts all survey participants at the same level of understanding.

Administering the Euthanasia Survey

After viewing the video, each participant answered the survey questions pertaining to the euthanasia video. The survey (Appendix D, English and Appendix E, Spanish) included: demographic information about the workers, and information regarding their attitudes and willingness to euthanize pigs. The design of the survey included a combination of check boxes: short answer, yes/no answers, and a Likert scale of

"strongly agree" to "strongly disagree" questions. The responses of the participants to the demographic information and the questionnaire section were used in conjunction with the Keirsey Temperament Sorter to determine if there is any correlation between the variables.

Administering the Keirsey Temperament Sorter

The temperament sorter used in this survey (Appendix E) was chosen for its simplicity, reading level, translations, cost and acceptance in the psychological testing arena. The Keirsey-Temperament Sorter identifies four distinct temperaments: Rationalist (NT), Idealist (NF), Guardian (SJ), and Artisans (SP). The results of the survey were analyzed and correlations were completed using Statistical Package for the Social Sciences, Version 10.0 (SPSS 10.0) and Statistical Analysis Systems, Version 8.2 (SAS 8.2). After determining the temperament of each participant, correlations were assessed between the independent variables to determine if there were any relationships between the employees' temperaments and preferred euthanasia methods.

Analysis of Data

This research is a descriptive study that explores human perception of swine euthanasia, employee personality types, and an employee's willingness to euthanize and his or her attitude toward euthanasia. Reliability and validity of the study is determined by face or content validity.

The face or content validity was determined by a panel of professionals who critiqued each item as representing the behavior that it reported to measure. For internal validity, Cronbach's alpha was computed ($\alpha = .7$). With this coefficient indicating internal consistency, the respondents' scores were summed across the 25 items to yield a composite score. The theoretical framework suggests two dependent research variables. The dependent variable attitude was determined by summing the 26 Likert scaled questions in the euthanasia survey. The attitude questions were used to produce a high and low attitude score for each respondent. An attitude scale of positive, ambivalent or negative was used to analyze each respondent's attitude toward euthanasia.

The dependent variable willingness was developed by analyzing the 10 yes and no questions in the survey (Appendix D). The respondent's yes and no responses were summed to create a respondents willingness score. A willingness scale was developed using a scale of "most", "some", or "little" to determine an employee's willingness to euthanize.

Two statistical packages were used to analysis the data. The Statistical Package for the Social Sciences (SPSS 10.0) was used to analyze the data from the two surveys. The independent variables analyzed include age, gender, religion, years worked in the industry, ethnic identification, education level, and areas worked in swine production. The Statistical Analysis Systems (SAS 8.2) statistical package was used to complete the multivariate analysis of the two dependent variables.

CHAPTER 4

RESULTS

After extensive interviews with focus groups and farm managers, several factors were evident. The welfare of the animals and the welfare of the animal caretakers are important in ensuring a viable animal production unit. Employers need to understand the differences in employees' personalities so better placement can be achieved, yielding a more productive employee. This study is designed to determine the personality types of swine employees and their preferred methods of swine euthanasia. Demographic variables were utilized to determine differences in an employee's willingness and attitude toward euthanasia.

The hand delivery method of administering the survey yielded a 100 percent survey recovery rate. The author of the study completed a visit to each of the sample farms in a three-month period of time. The initial number of respondents expecting to complete the surveys was 400 employees. The number of employees on a farm varies from day to day due to sickness and planned vacations. The random systematic stratified sampling technique determined that 47 farms must be surveyed to reach the predetermined number of respondents that would make the euthanasia study a valid research project.

The analysis of the study is divided into four areas, which include the demographic information of the respondents,

analysis of the study as it relates to the eight research questions, the attitude and willingness of employees in relation to various independent variables, and the multivariate model analysis. The euthanasia survey analysis involves results from three different questioning styles, forced-choice, Likert scale and yes/no questions. The euthanasia survey questions were peer reviewed in order to establish valuable information regarding each of the research questions.

Demographic Data

The following data section reviews the information collected on the independent variables that are used to describe the swine production workforce in the Eastern North Carolina study. The independent variables include race, gender, education level, employee age, years euthanizing animals, employee job title, type euthanasia training areas worked, methods of coping with stress, farrowing euthanasia methods, nursery euthanasia methods, heaviest pig euthanized, preferred training method, feelings after euthanasia and religious denomination.

The following data represent the distribution of respondents for each of the independent variables.

Race: The survey participants checked whether they were African American/Black, White, American Indian, Asian or Pacific Islander, Hispanic/Latin. The results of the racial or

ethnic identification of the survey respondents are presented in Table 1. The highest proportion (n=187, 48.9 percent) of the swine production employees are White. The Hispanic population represents the next largest segment of the respondents with (n=135, 35.2 percent). Black respondents numbered 53 (13.8 percent) of the swine worker population. The American Indian swine production employees included only 7 (1.8 percent) of the respondents. The smallest group represented in the research was the Asian population with 1 (.3 percent) of the respondents.

Table 1. *Distribution of Respondents by Ethnic Background*

Race	N	Percent
Black	53	13.8
White	187	48.8
American Indian	7	1.8
Asian	1	.3
Hispanic	135	35.3
Total	383	100.0

Gender: Gender of the swine production employees is displayed in Table 2. The majority of the respondents are male (n=266, 69.6 percent). Females represent 30.4 percent of the respondents (n=116).

Table 2. *Distribution of Respondents by Gender*

Gender	N	Percent
Male	266	69.6
Female	116	30.4
Total	383	100.0

Educational Level: Respondents' levels of education are presented in Table 3. The survey utilized nine educational levels. The largest number of respondents (n=172, 44.9 percent) have a twelve-year education. Fifty-two respondents (13.6 percent) have less than eight years of education. Employees with greater than a twelve-year education are represented by 21.6 percent of the surveyed population.

Table 3. *Distribution of Respondents by Educational Level*

Education	N	Percent
< 8	52	13.7
8	13	3.4
9	25	6.5
10	17	4.4
11	21	5.5
12	172	44.9
Associate	27	7.0
Bachelor	27	7.0
Master	14	3.7
Other	15	3.9
Total	383	100.0

Age: Ages of the swine production employees are presented in Table 4. The age factor is divided into six groups. The data indicate that a large number of respondents (n=170, 44.8 percent) are between twenty-five and thirty-four years old. The data reveal (n=40, 10.6 percent) that there are fewer people in the age bracket of fifty to seventy-two years old. The lowest age bracket, eighteen to twenty-four years old, have 11.6 percent respondents. Swine workers over the age of fifty equal 10.6 percent of the workforce.

Table 4. *Distribution of Respondents by Age*

Age	N	Percent
18-24	44	11.6
25-29	89	23.5
30-34	81	21.3
35-39	50	13.2
40-49	75	19.8
50-72	40	10.6
Total	383	100.0

Euthanize Pigs: Employees that currently euthanize or have euthanized pigs as part of their job responsibilities are represented in Table 5. A large majority of employees (n=323, 90.5 percent) indicate that euthanasia is a part of their job responsibilities.

Table 5. *Swine Producers That Currently Euthanize or Have Euthanized Pigs in the Past (n=357)*

Euthanize	N	Percent
Yes	323	90.5
No	34	9.5
Total	357	100.0

Years Euthanizing Pigs: The number of years an employee has been euthanizing pigs as part of their job responsibilities is represented in Table 6. There are six different levels represented by the data. The majority of the employees (n=328, 86.3 percent) have been euthanizing pigs less than ten years.

Table 6. *Number of Years Employees Have Been Working On Farms Where They Had To Euthanize Pigs*

Years	N	Percent
1 or less	75	19.8
2-5	149	39.2
6-10	104	27.4
11-15	37	9.7
16-20	5	1.3
21 or more	10	2.6
Total	383	100.0

Who Administered the Euthanasia Training: Euthanasia training is a critical process. Hands-on training by farm managers appears to be the most common method of training as shown in Table 7. The farm managers complete most of the farm euthanasia training (n=208, 53.6 percent). Company literature method of euthanasia training is the least common method (n=27, 7.0 percent).

Table 7. *Who Administered The Euthanasia Training*

Trainer	N	Percent
Farm Manager	208	53.6
Another Employee	145	37.4
Company Trainer	48	12.4
Company Literature	27	7.0
Other	20	5.2

Areas That Farm Employees Have Worked One Week or More: The areas in swine production that the employee has worked one week or more is indicated in Table 8. Respondents can choose one or more areas. The data indicate that a large number of employees (n=283, 72.9 percent) have worked in the breeding area. The farrowing area is also well represented. Many of the employees are currently working or have worked in this area (n=289, 74.5). The high representation of employees working in breeding and farrowing departments is valid since most of the

farms completing the survey were farrow to wean farms. The data reveal that fewer (n=176, 45.4 percent) of the farm workers have worked in the nursery area. The data suggest that approximately one third (n=127, 32.7 percent) of the workers completing the survey work in the finishing department.

Table 8. *Swine Departments That Employees Have Worked One Week Or More (n=388)*

Departments	N	Percent
Breeding	283	72.9
Farrowing	289	74.5
Nursery	176	45.4
Finisher	127	32.7
Other	17	32.7

Coping With Stress: How the respondents on the swine farms deal with stress is represented in Table 9. Methods of dealing with stress are categorized in five methods. The data suggest that the largest number of respondents cope with the stress of euthanasia by doing the procedure as quickly as possible (n=176, 45.4 percent). The data reveal that many respondents (n=145, 37.4 percent) do not feel euthanasia is stressful. There is a number of respondents that have problems dealing with stress. Some of the respondents cope by talking it over with someone else (n=37, 9.3 percent).

Table 9. *Methods Of Coping With The Stress Of Euthanasia On Swine Farms*

Coping Methods	N	Percent
Talking It Over With Someone Else	37	9.3
Being By Myself	26	6.5
Doing Euthanasia Quickly	176	44.4
Euthanasia Is Not Stressful	145	36.5
Other	13	3.3
Total	383	100.0

Method Of Euthanasia Used On Farm For Pigs 1-12 lbs.: A majority of farm employees (n=363, 93.6 percent) reported that the blunt trauma method is used on their farm. The data reveal that fewer (n=8, 2.1 percent) use carbon dioxide gas to euthanize 1-12 lb. pigs.

Table 10. *Method of Euthanasia Used On Farm To Euthanize Pigs 1-12 lbs.*

Method	N	Percent
Blunt Trauma	363	93.6
Electrocution	4	1.0
CO ₂	8	2.1
Lethal Injection	4	1.0
Other	10	2.6
Total	383	100.0

Method Of Euthanasia For Nursery Pigs 13-40 lbs.: The data in Table 11 indicate that half of the farm employees responding to the survey (n=194, 50 percent) use blunt trauma to euthanize nursery pigs. None of the respondents use electrocution as a method of euthanasia in nursery pigs. At the present time, a small number of respondents (n=12, 3.1 percent) use carbon dioxide as a method of euthanasia.

Lethal injection is rarely used as a euthanasia method due to safety issues (n=4, 1.0 percent). A significant amount of individuals (n=150, 38.7 percent) use the approved method of captive bolt gun to euthanize nursery pigs.

A small number of respondents (n=31, 8.0 percent) use other methods to euthanize nursery pigs.

Table 11. *Methods Used To Euthanize Nursery Pigs On Swine Farms*

Method	N	Percent
Blunt Trauma	194	50.0
Electrocution	0	0
CO ₂	12	3.1
Lethal Injection	4	1.0
Bolt Gun	150	38.7
Other	31	8.0
Total	383	100.0

Rank Level Of Safety: Swine farm employees were asked to rank the method of euthanasia they feel is the safest method to euthanize pigs. As indicated in Table 12, approximately one half of the employees (45.1 percent) think blunt trauma is a safe method of euthanasia. Thirty-six percent (n=124) of the employees think carbon dioxide is a safe method of euthanasia for the employee performing the procedure.

Table 12. *Perceived Safety Level of Euthanasia Methods*

Method	Frequency	Percent
Blunt Trauma	157	45.1
CO ₂	124	35.9
Bolt Gun	94	25.9
Rifle	15	4.4
Other	1	.3

Heaviest Pigs Killed With Blunt Trauma: The swine production employees indicate that there is no outstanding weight range of the heaviest pigs killed with blunt trauma. The data in Table 13 represent five weight ranges: 1-10 lbs., 11-15 lbs., 16-20 lbs., 21-30 lbs., and over 31 lbs. The percentages are fairly evenly distributed throughout the indicated ranges. The category designated as 31 lbs. or more has a significant number of respondents. Employees killing pigs with blunt trauma that weigh more than 31 lbs. equal 18.3 percent of the respondents.

Table 13. *What Are The Heaviest Pigs Killed With Blunt Trauma*

Weight	N	Percent
1-10 lbs.	128	33.0
11-15 lbs.	81	20.9
16-20 lbs.	65	16.8
21-30 lbs.	56	14.4
31 lb. or more	71	18.3
Total	383	100.0

Training Methods: The methods of euthanasia training that swine production employees prefer is depicted in Table 14. The data indicate that over seventy-five percent (n=295, 76 percent) of the respondents prefer euthanasia training to be performed on the farm. The data indicate that approximately one-third of the employees prefer video (n=120, 30.9 percent) as a method of training. Internet training is viewed by the respondents (n=19, 4.9 percent) as a less viable method of receiving euthanasia training.

Table 14. *Training Method Preferred By Swine Production Employees (n=383)*

Method Preferred	N	Percent
In classroom	73	18.8
On farm	295	76.0
Video	120	30.9
Internet	19	4.9
Other	5	1.3

The data in Table 15 illustrate that the majority of swine employees (n=263, 67.8 percent) report that they feel fine with the euthanasia process. One-fifth of the respondents (n=84, 21.6 percent) feel sad after completing the process.

Table 15. *Employees Feelings After Performing Euthanasia*

Response	N	Percent
Feel Sick to Stomach	10	2.6
Think About It All Day	18	4.6
Am Sad	84	21.6
Feel Fine	263	67.8
Other	13	3.4
Total	388	100.0

Baptist and Catholic denominations represent the largest two groups of respondents. Table 16 indicates that the Baptist denomination is represented by 35.8 percent of the respondents. The Catholic denomination has the second largest number of respondents (N=123, 32 percent). The Orthodox Jew denomination is not represented in this selected population of swine employees.

Table 16. *Religious Denomination*

Denomination	N	Percent
Baptist	138	35.8
Catholic	123	32.0
Holiness	34	8.8
Methodist	20	5.1
Mormon	5	1.3
Muslim	3	0.7
Orthodox Jew	0	0.0
Presbyterian	10	2.6
Other	53	13.7
Total	386	100.0

The surveys were administered in two languages, English and Spanish. As depicted in Table 17, the respondents had the option of choosing the language they preferred, regardless of their nationality. The majority of the respondents chose English as their preferred language for the survey (n=255, 65.9 percent).

Table 17. *Language Reported by Farm Employees*

Language	N	Percent
English	255	65.9
Spanish	132	34.1
Total	387	100.0

Preferred Method

Research Question 1: Which method of euthanasia, blunt trauma, electrocution, lethal injection, bolt gun, rifle or carbon dioxide gas, do employees prefer? (Tables 18 and 19)

The first research question involves the swine employee's preferred euthanasia method. The following analysis is a summary of the data dealing with the preferred euthanasia method. This information could be indirectly related to the process of choosing a euthanasia method.

A large percentage of the respondents (n=287, 73.7 percent) agree or strongly agree that the euthanasia process used to euthanize 1-12 pound pigs is the best method of euthanizing. A small number of the respondents (n=49, 12.7 percent) disagree or strongly disagree that the method currently used on their farm is not the best method of euthanasia.

A number of employees agree or strongly agree (n=250, 65.1 percent) that carbon dioxide gas appears to be less painful for the pigs than blunt trauma.

Many of the employees object to the process of holding the pig in their hands while performing euthanasia. A number of respondents (n=175, 45.7 percent) agree or strongly agree that they do not like to hold the pig while performing euthanasia. The data reveal that 23.2 percent of the employees (n=89) have no opinion about holding the pig while completing the euthanasia process. Approximately one-third of the

employees (n=119, 31.1 percent) disagree or strongly disagree that they do not like to hold the pig.

The majority of swine workers that perform euthanasia (n=161, 55 percent) agree or strongly agree that they would use a method of euthanasia that would take longer if the pig suffered less. This factor could have a effect on preferred method of euthanasia. Twenty-five percent of the respondents were not willing to take more time to euthanize pigs.

The farm employees responded positively to the question about animal rights. A positive response to this question could effect the euthanasia method an employee chooses. A high percentage of the respondents (n=302, 77.8 percent) agree that animals have rights. A small percentage of employees (n=28, 7.5 percent) do not feel animals have rights.

A majority of respondents (n=236, 61.6 percent) agree or strongly agree that humans should have control over animals. A small percentage of the workers (n=18, 4.7 percent) strongly disagree that humans should have control over animals.

As illustrated in Table 10, the blunt trauma method of euthanasia is used by a majority of farms to euthanasia 1-12 lb. pigs (n=363, 93.6 percent). This method is an approved euthanasia method by the National Pork Board and the American Association of Swine Practitioners.

Perceived Level Of Pain

Research Question 2: Does the employee perceive the pain of the pig as an important factor when choosing a euthanasia method? (Tables 18 and 19)

The following information describes the swine employee's perceived level of pain experienced by the pig with regards to choosing a euthanasia method.

A majority of the respondents agree or strongly agree that sick pigs who appear to be in pain are easier to euthanize than pigs that show no signs of sickness (n=175, 71.6 percent). Less than one fifth of the respondents (n=74, 19.2 percent) disagree or strongly disagree that sick pigs are easier to euthanize than well pigs. Less than ten percent (n=35, 9.1 percent) of the respondents had no opinion on the wellness of the pig in relation to the euthanasia of the pig.

The swine employees overwhelmingly agree (n=334, 86.6 percent) that it is more humane to euthanize a sick pig that appears to be in pain than let it suffer and die naturally in its environment.

A majority of the respondents (n=240, 52.6 percent) have euthanized a pig that did not appear to be sick. These pigs could have been classified as having other health related problems that required euthanizing. A euthanasia decision tree can be found in Appendix F. This protocol helps employees make responsible euthanasia decisions.

Perceived Level of Safety

Research Question 3: Do employees perceive safety as an important factor in performing euthanasia? (Tables 18 and 19)

The safety questions were selected to determine if safety is an issue with euthanizing pigs.

Safety is an important issue in swine euthanasia. The safety of employees when euthanizing 1-12 lb. pigs is explored in this question. A large number (n=300, 78.9 percent) of the employees agree or strongly agree that the blunt trauma method of euthanasia is a safe method for a 1-12 lb. pig. In contrast, a smaller number of employees (n=45, 11.8 percent) disagree or strongly disagree that blunt trauma is a safe method of euthanasia. The data reveal that less than ten percent of the employees (n=35, 9.2 percent) had no opinion on the subject.

Employees were asked to compare the safety level of carbon dioxide gas euthanasia to blunt trauma or the bolt gun. The data suggest that the combined responses of the agree or strongly agree scale yields more than fifty percent of the employees (n=212, 55.1 percent) agreeing that carbon dioxide gas as a euthanasia method is safer than blunt trauma. The data suggest that less than one-fourth of the employees (n=87, 22.6 percent) disagree or strongly disagree that carbon dioxide gas is safer.

A majority of the swine employees (n=244, 64 percent) feel the bolt gun method of euthanasia is safe. A small

percentage of respondents (6.3 percent) strongly disagree with the safety aspects of bolt gun euthanasia.

Swine departments that employees have worked in one week or more are presented in Table 8. The two areas employees have worked in the most include breeding (n=283, 72.9 percent) and farrowing (n=289, 74.5 percent). Most of the farms surveyed were farrow to wean farms, which accounts for the large numbers in these areas.

Speed of Euthanasia

Research Question 4: Which method of euthanasia, blunt trauma or carbon dioxide gas, do employees perceive as being the fastest method of euthanasia for the pig? (Tables 18 and 19)

The survey questions associated with the speed of the euthanasia process complies with the National Pork Board and the AASP definition of euthanasia. As discussed in the literature, euthanasia methods must be fast and painless for the pig. The following analysis explores the perception of farm employees related to the speed of currently used and new euthanasia methods.

Respondents were asked to determine if blunt trauma euthanasia is quicker than carbon dioxide gas euthanasia. A number of respondents (n=159, 41.3 percent) agree that blunt trauma euthanasia is quicker than carbon dioxide gas. A smaller number of respondents strongly agree (n=115, 29.9 percent) that blunt trauma is quicker than carbon dioxide gas.

The combinations of agree to strongly agree respondents represent 71.2 percent of the employees. A small number of employees (n=49, 12.7 percent) have no opinion pertaining to the speed of blunt trauma euthanasia.

Employees deal with stress in many ways. An analysis of Table 9 reveals most employees deal with stress by doing it quickly (n=176, 44.4 percent).

Preferred Training Method

Research Question 5: What method of euthanasia training do employees prefer? (Tables 18 and 19)

Proper training information is important in preparing future industry training classes. Industry trainers need to know which training methods company employees prefer.

An overwhelming majority of respondents (n=302, 79 percent) agree that training on euthanasia techniques would be helpful. A smaller number of employees (n=29, 7.6 percent) did not feel training on euthanasia techniques would be helpful.

A majority of employees (n=235, 61.5 percent) would like to receive more training on proper euthanasia techniques. Even though many of the employees have several years experience, they feel proper training would be beneficial.

On-farm training is the preferred method of farm euthanasia training by the respondents (n=295, 76 percent) in Table 14. Many farm employees prefer the hands-on method of training.

A majority of respondents selected on-farm euthanasia training conducted by the farm manager (n=208, 53.6 percent). Some employees (n=145, 37.4 percent) prefer training to be conducted by another farm employee, as shown in Table 7.

Time/Method of Euthanasia

Research Question 6: Do employees perceive the time it takes to complete the euthanasia process as an important factor in choosing a euthanasia method? (Tables 18 and 19)

Farm employees are continually looking for ways to decrease the amount of time it takes to complete a task. The following analysis addresses the euthanasia issue associated with the euthanasia process.

Eighty percent of the respondents (n=310, 80.1 percent) agree they would prefer a method of euthanasia that was painless even though the process could take more time to perform. This statistic could indicate that employees are conscious of the pain felt by the pig and are interested in the welfare of the pig.

Perceived Stress Level

Research Question 7: Do employees perceive the euthanasia of pigs as a stressful part of the job? (Tables 18 and 19)

Altering stressful tasks could improve job satisfaction, job performance and employee turnover. The following analysis explores the area of employee stress associated with farm euthanasia.

The data indicate that a large percentage of the swine production respondents (n=251, 64.7 percent) agree or strongly agree that euthanasia becomes easier the more they perform the process.

The respondents agree or strongly agree (n=192, 50.1 percent) that euthanasia of 1-12 lb. pigs is more difficult for females to perform than for males.

Employees were asked to respond to the following statement, "Euthanasia of sick pigs is necessary, but I wish I never had to do it again." The data indicate that a number of employees (n=178, 46.4 percent) agree or strongly agree that they wish they never had to euthanize pigs again. There are fewer respondents disagreeing or strongly disagreeing with the statement (n=117, 30.5 percent).

Employees responded to the emotional affects of euthanizing a pig that appears to be healthy but must be euthanized for other production reasons

Slightly more than one out of ten respondents strongly agree (n=53, 13.7 percent) that euthanasia of a seemingly

healthy pig makes them sad or nervous. This information is compared to one out of three employees who agree (n=114, 29.5 percent) that the euthanasia of seemingly healthy pigs is emotionally upsetting. A total of the respondents that agree or strongly agree yield almost half (n=167, 43.2 percent) of the employees.

A number of swine employees responded disagree to strongly disagree to the question about getting emotionally upset when euthanizing apparently sick pigs. The data reveal many (n=238, 61.8 percent) of the respondents have little or no negative emotional response to euthanizing sick pigs. Euthanizing sick pigs does not seem to be emotionally upsetting to swine employees.

The swine employees are divided on their view of the physical damage left by the bolt gun. The respondents agree or strongly agree (n=143, 37.4 percent) that the physical damage caused by the bolt gun has an affect on them. Fewer of the respondents disagreed or strongly disagreed (n=119, 31.1 percent) that the hole in the head did not affect their emotions.

Employees were asked if they could euthanize a sick family pet. A majority of the employees (n=222, 57.3 percent) answered positively to the question. Fewer of the respondents (n=124, 32 percent) felt they could not euthanize their pet.

A large percentage of the respondents (n=318, 82.1 percent) agree that an employee could effectively nurture pigs and perform euthanasia when necessary.

A number of employees (n=190, 49.4 percent) agree or strongly agree that they would not be bothered if they had to euthanize all of the sick pigs on the farm everyday. Fewer of the employees (n=131, 34 percent) did not favor euthanizing all the sick pigs.

More than three fourths of the respondents (n=313, 80.8 percent) agree that euthanasia on the job has no affect on their personal or home life. A smaller percentage of employees (n=29, 7.5 percent) agree that euthanasia affects them in their personal and home life. Two-thirds of the respondents (n=255, 66.2 percent) do not feel that as they get older, euthanasia becomes harder to perform.

According to this study, less than one half of the respondents grew up on a farm (n=164, 42.3 percent). According to government statistics, the number of farms is decreasing and less than 2 percent of the population has farm related jobs (McGlone, 2003).

Evidently farm employees understand what is expected of them as a part of their daily task. A majority of the respondents (n=315, 81.8 percent) consider euthanasia as a part of their job responsibilities. Is it possible that a complete understanding of job responsibilities could create a more satisfied employee resulting in fewer turnovers?

Respondents were split on the question about being paid more to perform all of the necessary euthanasia on the farm. Forty-six percent of the employees (n=178, 46.1 percent) agreed that they would be willing to euthanize all the pigs if

they were compensated for completing the process. This could create a better understanding of pig health and a desire to do what is best for the pig.

As discussed in the literature, making a decision to euthanize an animal is a major decision. A majority of the survey respondents (n=270, 70.3 percent) decide which pig to euthanize on their farm. Farm protocols are used to help employees make educated decisions on which pig to euthanize (Appendix, F).

The employees appear to know what is expected of them and do not let it affect their job outlook. An overwhelming number of employees (n=350, 91.4 percent) verify that farm euthanasia does not compel them to resign from their job after performing the process.

A majority of respondents (n=249, 64.5 percent) do not become emotionally attached to the pigs they nurture. Therefore, euthanizing is not a problem if the sick pigs meet the euthanasia protocol prescribed by the company. Arluke (1994) suggest, many animal shelter employees distance themselves from the animals they nurture, thus helping the employee cope with the stress of euthanasia.

Approximately three fourths of the respondents (n=276, 72 percent) strongly agree that they are religious. A total of 109 employees responding (28.2 percent) do not have an opinion or do not consider themselves religious.

The swine production employees expressed their feelings about the physical damage caused by the bolt gun when

euthanizing nursery pigs. The data reveal that a small number of employees (n=39, 10.2 percent) strongly agree that the hole left by the bolt gun is unsightly. On the other end of the spectrum, ten percent of the employees (n=39, 10.2 percent) strongly disagree and do not have a problem with the physical damage left by the bolt gun. A number of respondents (n=104, 27.2 percent) agree that they do not like the physical damage left by the bolt gun.

Item	Strongly Agree		Agree		No Opinion		Disagree		Strongly Disagree		Mean
	N	%	N	%	N	%	N	%	N	%	
Consider Myself Religious	97	25.2	179	46.5	79	20.5	13	3.4	17	4.4	2.2
Euthanasia Becomes Easier the More I Do It	93	24.2	158	41.1	59	15.4	56	14.6	18	4.7	2.3
Euthanasia Process is Best Current Method (1-12)	121	31.3	165	42.7	51	13.2	36	9.3	13	3.4	2.1
Harder for Females to Euthanize (1-12 lb)	75	19.6	117	30.5	71	18.5	90	23.5	30	7.8	2.7
Euthanizing Pig Not Sick is Harder	124	32.3	151	39.3	35	9.1	47	12.2	27	7.0	2.2
Carbon Dioxide Gas Appears Less Painful	11 ¹	28.9	139	36.2	63	16.4	48	12.5	23	6.0	2.3
Blunt Trauma Euthanasia is Quicker	115	29.9	159	41.3	49	12.7	48	12.5	14	3.6	2.2
I Wish I Didn't Have to Euthanize	64	16.7	114	29.7	89	23.2	82	21.4	35	9.1	2.8
I Get Sad and Upset, Pig Not Sick	53	13.7	114	29.5	87	22.5	93	24.1	39	10.1	2.9
I Get Upset Euthanizing Sick Pigs	28	7.3	66	17.1	53	13.8	161	41.8	77	20.0	3.5
Physical Process is the Hardest Part (1-12 lb)	38	9.9	134	34.9	65	16.9	106	27.6	41	10.7	2.9
Bolt Gun on Nursery Pig Physical Damage	39	10.2	104	27.2	120	31.4	80	20.9	39	10.2	2.9
I Do Not Like to Hold Pigs While Euthanizing	38	9.9	137	35.8	89	23.2	95	24.8	24	6.3	2.8
Blunt Trauma is Safest Method for Farrowing Pig	108	28.4	192	50.5	35	9.2	32	8.4	13	3.4	2.1

Item	Strongly Agree		Agree		No Opinion		Disagree		Strongly Disagree		Mean
	N	%	N	%	N	%	N	%	N	%	x
Carbon Dioxide Gas is Safer For Employees Than Blunt Trauma	78	20.3	134	34.8	86	22.3	67	17.4	20	5.2	2.5
Bolt Gun is a Safe Method to Euthanize Nursery Pigs	55	14.4	189	49.5	51	13.4	63	16.5	24	6.3	2.5
Take Longer to Euthanize if Pigs Suffer Less	56	14.5	156	40.5	78	20.3	75	19.5	20	5.2	2.6
Training Would be Helpful	96	25.2	206	54.1	50	13.1	21	5.5	8	2.1	2.1
I Could Euthanize My Family Pet	71	18.3	151	39.0	41	10.6	65	16.8	59	15.2	2.7
Employees Can Euthanize and Nurture Pigs	148	38.2	170	43.9	45	11.6	16	4.1	8	2.1	1.9
I Could Euthanize All the Pigs That Needed to be Euthanized	53	13.8	137	35.6	64	16.6	79	20.5	52	13.5	2.8
More Humane to Euthanize Than Let Animal Die Natural	174	45.1	160	41.5	25	6.5	14	3.6	13	3.4	1.8
Euthanizing Effects My Personal Life	12	3.1	17	4.4	45	11.6	165	42.6	148	38.2	4.1
Animals Have Rights	122	31.4	180	46.4	58	14.9	13	3.4	15	3.9	2.0
The Older I Get Euthanasia Becomes Harder to Do	21	5.5	48	12.5	61	15.8	186	48.3	69	17.9	3.7
Humans Have Control Over Animals	94	24.5	142	37.1	64	16.7	65	17.0	18	4.7	2.4

Table 19. *Employees Responses and Perceptions Regarding Swine Euthanasia*

	Yes		No	
Do You Work With Rescue Squad or Volunteer Services	57	14.7	274	85.3
Did You Grow Up On a Livestock Farm	164	42.6	221	57.4
Euthanizing Pigs is Considered a Part Of My Job	315	81.8	70	18.2
Have You Ever Euthanized a Pig That Did Not Appear Sick	204	52.6	184	47.4
I Would Use a Less Painful Method Even If It Took Longer	310	80.1	77	19.9
I Would Euthanize All the Pigs On the Farm If I Got Paid More	178	46.1	208	53.9
Do You Decide If a Pig Needs to be Euthanized	270	70.3	114	29.7
Have You Ever Wanted to Resign After Euthanizing	33	8.6	350	91.4
Have You Ever Been to Attached to Animal to Euthanize	137	35.5	249	64.5
I Would Like More Training on Euthanizing Pigs	235	61.2	149	38.8

Employees Temperament

Research Question 8: Is there a correlation between employees' temperament and his or her willingness to euthanize pigs and his or her attitude toward euthanizing pigs?

The following data analysis explores the psychological types of employees working on Eastern North Carolina swine farms. The following data analysis researches the relationship between an employee's temperament, his or her attitude toward euthanasia, and his or her willingness to euthanize.

The psychological type of each employee was determined by using the Keirsey Temperament Sorter. The survey results in Table 20 yield the following.

After completing the Keirsey Temperament Sorter, all but one of the psychological types was represented by the swine employee population. The largest percentage of respondents (n=323, 84 percent) was recognized by Keirsey's "Guardian" personality type. These types include ESTJ (n=139, 36.2 percent), ISTJ (n=64, 16.6 percent), ESFJ (n=70, 18.2 percent), and ISFJ (n=50, 13 percent).

The only psychological type not represented by the euthanasia survey population is the INTP. According to past research by Myers and Keirsey, this personality type is not found in ordinary places. Only one percent of the population is categorized as an INTP personality type.

Socio-demographic Factors
Associated with Willingness and Attitude

Research Question 9: Do selected socio-demographic factors influence an employee's attitude toward euthanasia and/or willingness to euthanize pigs?

Certain socio-demographic factors in the research project appear to have an effect on an employee's attitude toward euthanasia. A larger proportion of non-white employees (n=79, 40 percent) have a negative attitude toward euthanasia, compared to the proportion of white employees (n=42, 22 percent). The Spanish speaking employees are the least willing (n=59, 44 percent) to euthanize pigs compared to the English speaking employees (n=73, 29 percent). There is a significant relationship between the attitude of an employee toward euthanasia and the gender of the employee. Female employees have a more negative attitude toward euthanasia (n=47, 41 percent) than male employees (n=73, 23 percent).

Employees working on swine farms with a high school education or higher (n= 54, 61 percent) have had to euthanize pigs that did not appear to be sick. In comparison, employees with less than a high school education (n= 53, 41 percent) have not had to euthanize a pig that did not appear to be sick.

The female employees (n=99, 86 percent) are more likely to choose a less painful method of euthanasia than the male employees (n=205, 77 percent).

There is a relationship between the level of education of an employee and the willingness to use a less painful method of euthanasia even though the method may take longer. The higher the education level of the employee, the less willing he or she is to use a less painful method of euthanasia.

Socio-psychological Factors Associated with Willingness and Attitude

Research Question 10: Do selected socio-psychological factors influence an employee's attitude toward euthanasia and/or his or her willingness to euthanize pigs?

The ESTJ personality type represents the largest proportion of respondents (n=139, 37 percent). A majority of the ESTJ personality types have a more positive to ambivalent attitude toward euthanasia (n=98, 70.5 percent). The ISTJ personality types are represented by a positive attitude toward euthanasia (n=49, 76.6 percent). All of the employees have a higher ambivalent to positive attitude score except the ISPJ (n=38, 76 percent) and the INFJ (n=5, 83.3 percent) personality types. The INFJ personality types have too few

respondents to be considered a valid response. The largest percentage of employees with the ESTJ (n= 48, 34.5 percent) and ESFJ (n=27, 38.6 percent) personality types are least willing to euthanize pigs. The temperament of the employee has little effect on the attitude of the employee toward euthanasia. The ambivalent response of the respondents is replicated in each of the temperaments: SJ, SP, NT and NF. The respondents with an SJ temperament type have a more negative (n= 105, 32.4 percent) attitude toward euthanasia. A majority of the respondents yield a moderate ("some") willingness to euthanize pigs in all of the temperaments (ST, SP, NT, NF). The SJ (n=113, 34.9 percent) and the NF (n=5, 45.5 percent) represent the least willing to euthanize of all of the respondents.

The ESFJ personality types are the least willing to euthanize pigs (n=27,38.6 percent) and have the most negative attitude (n=27, 38.6 percent) toward euthanasia compared to the other personality types.

Farm Factors Associated with Willingness and Attitude

Research Question 11: Do selected farm factors influence an employee's attitude toward euthanasia and/or willingness to euthanize pigs?

There is a relationship between the number of years an employee has been euthanizing and his or her willingness to euthanize. Employees with the least number of years euthanizing (n=29, 39 percent) are the most willing to euthanize pigs. Employees with four or more years experience euthanizing pigs are the least willing to euthanize. There is no relationship between the attitude of the employees and their number of years they have been euthanizing.

The work areas on a swine farm include breeding, farrowing, nursery, and finishing. There was no significant relationship between the area of work and the willingness of an employee to euthanize. All of the areas had "some" willingness to euthanize pigs.

There is a relationship between the attitude of the employees toward euthanasia and the area in which they work. The employees working in the farrowing area have the most negative attitude toward euthanasia (n=25, 40 percent) compared to the finisher area employees (n=24, 21 percent).

Euthanasia Methods Associated with Attitude and Willingness

Research Question 12: Do selected euthanasia methods influence an employee's attitude toward euthanasia and/or willingness to euthanize pigs?

Employees with lower levels of willingness tend to use a less painful method of euthanasia (n=123, 40 percent) even if it takes more time to perform. A little more than 10 percent of the employees would not implement a less painful method of euthanasia. The painful effects of the method appear to have little effect on this group of employees' willingness to perform euthanasia. There is a relationship between the willingness to perform euthanasia and an employee that has to perform euthanasia on a pig that does not appear to be sick. A majority of employees (n=108, 53 percent) are less willing to euthanize a pig that does not appear to be sick compared to the employees that are most willing (n=8, 4 percent) to euthanize a pig that does not appear to be sick.

Interaction of Independent Variables in The Multivariate Model

Research Question 13: Does a combination of independent variables in the multivariate model influence an employee's attitude toward euthanasia and/or willingness to euthanize pigs?

In the multivariate model the interaction of the independent variables employee age, method of training, and area of work had an effect on an employee's attitude toward euthanasia. The attitude of the employee toward euthanasia was affected by gender.

As the age of the employee increases above 40 years old, the employee is less willing ($p < .05$) to euthanize pigs.

The female employees have a more ($p < .05$) negative attitude toward euthanasia than the male employees.

The preferred method of training by the employees is a company trainer ($p < .05$). The least preferred method of training is company literature.

Table 20. *Distribution of Respondents by Psychological Type*

Types	N	Percent
ESTP	9	2.3
ISTP	5	1.3
ESFP	9	2.3
ISFP	11	2.9
ESTJ	139	36.2
ISTJ	64	16.6
ESFJ	70	18.2
ISFJ	50	13.0
ENFJ	6	1.5
INFJ	6	1.5
ENFP	3	.8
INFP	1	.3
ENTJ	7	1.8
INTJ	2	.5
ENTP	3	.8
Total	385	100.0

The swine employees completed the Keirsej Temperament Sorter II to determine their temperament. The largest number of respondents (n=324, 84 percent) exhibits an SJ Temperament as represented in Table 21.

Table 21. *Distribution of Respondents By Temperament*

Temperament	N	Percent
SJ	324	84.1
SP	33	8.6
NF	17	4.4
NT	11	2.9
Total	385	100.0

The respondents' attitudes toward euthanasia are represented in Table 22. The employees' responses represent a positive, ambivalent or negative attitude toward euthanasia. The responses are equally distributed throughout the three areas. The positive and negative attitudes toward euthanasia are balanced representing 30 percent of the population respectively. The possible range of the responses is between 25 and 125 points. The lowest possible points accumulated equal 54, with the highest point accumulation reaching 96 points.

Table 22. *Distribution of Respondents by Their Attitudes Toward Euthanasia (n=388)*

Response	N	Percent
Positive (54-70)	118	30.4
Ambivalent (71-77)	148	38.2
Negative (78-96)	122	31.4
Total	388	100.0

There is a relationship ($\chi^2 = 28.08; P < .05$) between an employee's willingness to euthanize pigs and the number of years the employee has been euthanizing as depicted in Table 23. The willingness of an employee to euthanize pigs decreases as the number of years an employee works increase.

Employees with one-year experience in swine production are more willing to euthanize (n=29, 39 percent) than employees with four or more years experience (n=5, 8 percent).

Table 23. *Relationship Between the Willingness of An Employee to Euthanize and the Number of Years the Employee has been Euthanizing Pigs*

Willingness	1 year		2 years		3 years		4+ years		Total
	N	%	N	%	N	%	N	%	N
Most	29	39	31	21	11	11	5	8	76
Some	28	37	66	44	55	52	31	52	180
Little	18	24	52	35	38	37	24	40	132
Total	75	100	149	100	104	100	60	100	318

$\chi^2 = 28.08; df = 6; P < .05$

There is a relationship between the ethnic background of a swine employee ($\chi^2 = 16.51$; $P < .05$) and the employee's attitude toward euthanasia.

The proportion of non-white employees in Table 24 has a negative attitude toward euthanasia (n=79, 40 percent) compared to the proportion of white employees (n=42, 22 percent). Both groups, (white 40 percent and non-white 36 percent) are categorized as having an ambivalent attitude toward swine euthanasia.

Table 24. *Relationship Between the White and Non-white Employees and Their Attitude Toward Euthanasia*

Attitude	Non-white		White		Total	
	N	%	N	%	N	%
Positive	46	24	71	38	117	31
Ambivalent	71	36	74	40	145	38
Negative	79	40	42	22	121	31
Total	196	100	187	100	383	100

$\chi^2 = 16.51$; $df = 2$; $P < .05$

The respondents had a choice of two language preferences. The relationship between the two language preferences English and Spanish and their attitude toward euthanasia is reflected in Table 25 ($\chi^2 = 9.61$; $P < .05$). The Spanish-speaking employees ($n=55$, 42 percent) have a more negative attitude toward euthanasia than the English-speaking employees ($n=67$, 26 percent).

Table 25. *Relationship Between the Attitude Toward Euthanasia and the Employees Language Preference*

Attitude	Language				Total
	English		Spanish		
	N	%	N	%	
Positive	84	33	33	25	117
Ambivalent	014	41	44	33	148
Negative	67	26	55	42	122
Total	255	100	132	100	387

$\chi^2 = 9.61$; $df = 2$; $P < .05$

The respondent's level of education was divided into three groups; less than a high school education, a high school graduate, and greater than a high school education. The education level of the respondents has no significant relationship ($\chi^2 = 4.33$; $P > .05$) to an employee's willingness to euthanize pigs as represented in Table 26.

Table 26. *Relationship Between the Willingness of An Employee to Euthanize and the Level of Education*

Willingness	< High School Graduate		High School Graduate		> High School Graduate		Total	
	N	%	N	%	N	%	N	%
Most	21	17	38	22	17	19	76	20
Some	55	43	83	48	42	48	180	46
Little	52	40	51	30	29	33	132	34
Total	128	100	172	100	88	100	388	100

$\chi^2 = 4.33$; $df = 4$; $P > .05$

Periodically pigs must be euthanized that do not appear to be sick. There is a relationship ($\chi^2 = 10.14$; $P < .05$) between the education level of the swine employees and euthanizing pigs that do not appear to be sick as depicted in Table 27. Employees working on a swine farm with a high school education or higher have had to euthanize pigs that did not appear to be sick (n=54, 61 percent).

Table 27. *Relationship Between the Education Level of the Employee and the Euthanasia of A Pig the Did Not Appear To Be Sick*

	Education								
	< High School Education		High School Education		> High School Education		Total		
	N	%	N	%	N	%	N	%	
Pig Not Sick									
Yes	53	41	97	56	54	61	204	53	
No	75	59	75	44	34	39	184	47	
Total	128	100	172	100	88	100	388	100	

$\chi^2 = 10.14$; $df = 2$; $P < .05$

The gender of the employee in Table 28 is not related to an employee's attitude toward euthanasia. An analysis of the data in Table 28 suggest, there is significant relationship ($\chi^2 = 12.728$; $P < .05$) between the gender of the swine employee and their attitude toward euthanasia. Female employees have a more negative attitude toward euthanasia ($n=47$, 41 percent) than male employees ($n=73$, 27 percent).

Table 28. *Relationship Between the Gender of the Employee and Their Attitude Toward Euthanasia*

Attitude	Gender					
	Male		Female		Total	
	N	%	N	%	N	%
Positive	94	36	21	18	115	30
Ambivalent	99	37	48	41	147	39
Negative	73	27	47	41	120	31
Total	266	100	115	100	381	100

$$\chi^2 = 12.728; df = 2; P < .05$$

Are males more willing to perform euthanasia than females? The data in Table 29 concludes, the gender of the respondents has no significant relationship ($\chi^2 = .425$; $P > .05$) to the employee's willingness to perform euthanasia.

Table 29. *Relationship Between Gender and the Willingness to Perform Euthanasia*

Willingness	Gender					
	Male		Female		Total	
	N	%	N	%	N	%
Positive	52	20	24	21	76	20
Ambivalent	120	45	55	47	175	46
Negative	94	35	37	32	131	34
Total	266	100	116	100	382	100

$\chi^2 = .425$; $df = 2$; $P > .05$

An analysis of respondents by age in Table 30 concludes that there is no significant relationship ($\chi^2 = 1.12$; $P > .05$) between the age of the swine employee and their attitude toward euthanasia.

Table 30. *Relationship Between the Age of the Employee and Their Attitude Toward Euthanasia*

Attitude	Age							
	< 30		30-39		40 >		Total	
	N	%	N	%	N	%	N	%
Positive	43	32	37	28	36	30	116	30
Ambivalent	50	38	49	37	48	40	147	38
Negative	40	30	45	35	35	30	120	32
Total	133	100	131	100	119	100	383	100

$\chi^2 = 1.12$; $df = 4$; $P > .05$

The relationship between gender and using a less painful method to euthanize pigs is represented in Table 31 ($\chi^2 = 4.050$, $P < .05$). The female employees ($n=99$, 86 percent) are more likely to choose a less painful method of euthanasia than the male employees ($n=205$, 77 percent).

Table 31. *Relationship Between Gender and Completing Swine Euthanasia Using A Less Painful Method Even If the Process Took Longer*

Use A Less Painful Method	Gender					
	Male		Female		Total	
	N	%	N	%	N	%
Yes	205	77	99	86	304	80
No	61	23	16	14	77	20
Total	266	100	115	100	381	100

$\chi^2 = 4.050$; $df = 1$; $P < .05$

The employee's perceived level of pain felt by the pig has a relationship ($\chi^2 = 8.73$; $P < .05$) to the education level of an employee as indicated in Table 32. Employees with less than a high school education prefer to use a less painful method of euthanasia even though the procedure may take longer to perform. Employees with more than a high school education are 16 percent less likely to choose a less painful method of swine euthanasia if it takes longer (n=64, 72 percent).

Table 32. *Relationship Between the Level of Education and the Willingness to Use A Less Painful Method Even Though the Method May Take Longer*

Willingness to Use Less Painful Method	Level of Education						Total	
	< High School Education		High School Education		> High School Education			
	N	%	N	%	N	%	N	%
Yes	112	88	134	77	64	72	310	80
No	15	12	38	23	24	28	77	20
Total	127	100	172	100	88	100	387	100

$$\chi^2 = 8.73; df = 2; P < .05$$

A comparison of English-speaking employees and Spanish-speaking employees with relation to their willingness to euthanize is revealed in Table 33 ($\chi^2 = 11.00$; $P < .05$). The Spanish-speaking employees are the least willing to euthanize pigs (n=59, 44 percent).

Table 33. *Relationship Between An Employee's Willingness to Euthanize and Their Language Preference Either English or Spanish*

Willingness to Euthanize	Language Preference					
	English		Spanish		Total	
	N	%	N	%	N	%
Most	57	22	18	14	75	19
Some	125	49	55	42	180	47
Least	73	29	59	44	132	34
Total	255	100	132	100	387	100

$\chi^2 = 11.00$; $df = 2$; $P < .05$

The number of years an employee has been euthanizing pigs as shown in Table 34 appears to have no significant relationship ($\chi^2 = 6.237$; $P > .05$) to the employee's attitude toward euthanasia.

Table 34. *Relationship Between The Attitude To An Employee Toward and Their Years Euthanizing Pigs*

Attitude	Years Euthanizing									
	1 year		2 years		3 years		4+ years		Total	
	N	%	N	%	N	%	N	%	N	%
Positive	19	25	40	27	34	33	25	42	118	30
Ambivalent	30	40	59	40	41	39	18	30	148	38
Negative	26	35	50	33	29	28	17	28	122	32
Total	75	100	149	100	104	100	60	100	388	100

$\chi^2 = 6.237$; $df = 6$; $P > .05$

The education level of the employee has no significant relationship ($\chi^2 = 4.34$; $P > .05$) to the employee's willingness to euthanize pigs as indicated in Table 35.

Table 35. *Relationship Between An Employee's Education Level and Their Willingness to Euthanize Pigs*

Willingness to Euthanize	Education Level							
	< High School Education		High School Education		> High School Education		Total	
	N	%	N	%	N	%	N	%
	Most	21	16	38	22	17	19	76
Some	55	43	83	48	42	48	180	46
Little	52	41	51	30	29	33	132	34
Total	128	100	172	100	88	100	388	100

$\chi^2 = 4.34$; $df = 4$; $P > .05$

The attitude of the respondents has no significant relationship to the employee's attitude toward the euthanasia process. Thirty nine percent of the employees are ambivalent toward the euthanasia process as depicted in Table 36.

Table 36. *Relationship Between Attitude of the Employee Toward Euthanasia and the Employee's Level of Education*

Attitude	Level of Education							
	< High		High		> High		Total	
	School		School		School			
	Education		Education		Education		N	%
N	%	N	%	N	%	N	%	
Positive	34	26	55	32	29	33	118	30
Ambivalent	47	37	64	37	37	42	148	39
Negative	47	37	53	31	22	28	122	31
Total	128	100	172	100	88	100	388	100

$$\chi^2 = 3.724; \text{ df} = 4; P > .05$$

The age of employees working in the swine industry in Eastern North Carolina ranges from 18 years to 72 years old. There is no significant relationship ($\chi^2 = 3.399$; $P > .05$) between the age of the employees and their willingness to euthanize pigs as shown in Table 37.

Table 37. *Relationship Between the Willingness of An Employee to Perform Euthanasia and the Age of the Employee*

Willingness	Employee Age							
	< 30		30-39		40 +		Total	
	N	%	N	%	N	%	N	%
Most	22	17	29	22	25	21	76	20
Some	59	44	58	43	59	50	176	46
Little	52	39	44	35	35	29	131	34
Total	133	100	131	100	119	100	383	100

$\chi^2 = 3.399$; $df = 4$; $P > .05$

The employee's perception of pain felt by the pig is important. Employees prefer a less painful method of euthanasia. There is a relationship($\chi^2 = 3.399$; $P > .05$) between the willingness of an employee to use a less painful method of euthanasia even if the method takes longer to perform as represented in Table 38. A majority of the employees (n=310, 80 percent) agree they would use a less painful method.

Table 38. *Relationship Between the Willingness of An Employee to Use a Less Painful Method If It Took Longer to Perform*

Willingness	Use A Less Painful Method of Euthanasia					
	Yes		No		Total	
	N	%	N	%	N	%
Most	44	14	32	41	76	20
Some	143	46	36	47	179	46
Little	123	40	9	12	132	34
Total	310	100	77	100	387	100

$\chi^2 = 37.691$; $df = 2$; $P < .05$

According to the information in Table 39 farm employees do not like to euthanize pigs that do not appear to be sick (n=108, 53 percent). A small percentage of employees (n=8, 4 percent) are willing to euthanize pigs that do not appear to be sick. The relationship between the willingness of an employee to euthanize and the sick appearance of the pig is significant ($\chi^2 = 100.147$; $P < .05$).

Table 39. *Relationship Between Willingness and An Employee That Had to Euthanize A Pig That Does Not Appear To Be Sick*

Willingness	Pig Sick Appearance					
	Yes		No		Total	
	N	%	N	%	N	%
Most	8	4	68	37	76	20
Some	88	43	92	50	180	46
Little	108	53	24	13	132	34
Total	204	100	184	100	388	100

$\chi^2 = 100.147$; $df = 2$; $P < .05$

The attitude of a person euthanizing pigs does not have a significant relationship ($\chi^2 = 2.001$; $P > .05$) to the sick appearance of a pig. The responses of the employees are approximately equal in Table 40 for the positive, ambivalent, and negative responses with relation to employee's attitudes toward euthanizing a pig that does not appear to be sick.

Table 40. *Relationship Between An Employee's Attitude and Euthanizing A Pig That Does Not Appear to be Sick*

Attitude	Pigs Sick Appearance					
	Yes		No		Total	
	N	%	N	%	N	%
Positive	63	31	55	30	118	30
Ambivalent	83	41	65	35	148	38
Negative	58	28	64	35	122	32
Total	204	100	184	100	388	100

$\chi^2 = 2.001$; $df = 2$; $P > .05$

As indicated in Table 41, a pig's perceived level of sickness has no significant relationship ($\chi^2 = .272$; $P > .05$) to the gender of the employee to euthanize pigs.

Table 41. *Relationship Between the Gender of the Employee and Euthanizing A Pig That Does Not Appear to Be Sick*

Pig Sick Appearance	Gender					
	Male		Female		Total	
	N	%	N	%	N	%
Yes	143	54	59	51	202	53
No	123	46	57	49	180	47
Total	266	100	116	100	382	100

$$\chi^2 = .272; df = 1; P > .05$$

A number of the respondents (n=139, 37 percent) in Table 42 have an ESTJ personality type. The ESTJ personality type is defined by Keirse (1998) as being a supervisor, enforcer of the rules, quick to give a stamp of approval, feet firmly on the ground, cooperative with superiors and carry out orders without fail to the letter. The ESTJ personality accounts for at least ten percent of the population (Keirse, 1998). A majority of the ESTJ's has a more positive or ambivalent attitude toward euthanasia (n=98, 70.5 percent). The ISTJ personality types have a similar attitude response to that of the ESTJ. The ISTJ is identified by Keirse (1998) as, an inspector, hard-nosed, silent, distaste for distrust, orderly

environment, and they do not hesitate to report irregularities. The ISTJ personality type make up approximately ten percent of the general population (Keirse, 1998). The percentage of the ISTJs that have a positive attitude toward euthanasia is similar to the ESTJs (n=49, 76.6 percent). The ESFJ personality types have a more ambivalent to negative attitude toward euthanasia (n=52, 74.3 percent) than the ISTJ personality type.

Table 42. *Relationship Between the Employee Psychological Types and Their Attitude Toward Euthanasia*

	ESTP		ISTP		ESFP		ISFP		ESTJ		ISTJ		ESFJ		ISPJ	
Attitude	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Positive	3	33.3	1	20	1	11.1	3	27.3	45	32.4	27	42.2	18	25.7	12	24
Ambivalent	4	4.44	2	40	7	77.8	6	54.5	53	38.1	22	34.4	25	35.7	16	32
Negative	2	22.2	2	40	1	11.1	2	18.2	41	29.5	15	23.4	27	38.6	22	44
	ENFJ		INFJ		ENFP		INFP		ENTJ		INTJ		ENTP		INTP	
Attitude	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Positive	2	33.3	1	16.7	1	33.3	1	100	2	28.6	0	0	1	33.3	0	0
Ambivalent	3	50	2	33.3	2	66.7	0	0	3	42.9	1	50	1	33.3	0	0
Negative	1	16.7	3	50	0	0	0	0	2	28.6	1	50	1	33.3	0	0

The responses of the employees with regards to their willingness to euthanize is approximately equal throughout all the personality types with the majority of the employees' responses creating a curve between "most willing" and "least willing" with "some willing" to euthanize representing the majority of the personality types in Table 43.

Table 43. *Relationship Between the Willingness of An Employee to Perform Euthanasia and Their Personality Type*

	ESTP		ISTP		ESFP		ISFP		ESTJ		ISTJ		ESFJ		ISPJ	
Willingness	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Most	2	22.2	0	0	5	55.6	1	9.1	22	15.8	17	26.6	13	18.6	11	27
Some	5	55.6	4	80	3	33.3	7	63.6	69	49.6	26	40.6	30	42.9	22	44
Least	2	22.2	1	20	1	11.1	3	27.3	48	34.5	21	32.6	27	38.6	17	34
	ENFJ		INFJ		ENFP		INFP		ENTJ		INTJ		ENTP		INTP	
Willingness	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Most	1	16.7	1	16.7	0	0	0	0	0	0	0	0	0	0	0	0
Some	3	50	3	50	2	66.7	0	0	5	71.4	0	0	1	3.33	0	0
Least	2	33.3	2	33.3	1	33.3	1	100	2	28.6	2	100	2	66.7	0	100

The attitude of the respondents toward euthanasia by temperament in Table 44 is ambivalent with high and low scores (positive and negative) approximately equal. The ambivalent response is replicated in each of the employees' temperaments: SJ, SP, NT and NF. The SJ temperament types have a more negative attitude toward euthanasia (n=105, 32.4 percent) than the other temperaments (SP, NT, NF).

Table 44. *Relationship Between the Attitude of An Employee to Perform Euthanasia and Their Personality Type*

Attitude	Temperament							
	SJ		SP		NT		NF	
	N	%	N	%	N	%	N	%
Positive	103	31.8	7	21.2	3	27.3	6	35.3
Ambivalent	116	35.8	19	57.6	5	45.3	7	41.2
Negative	105	32.4	7	21.2	3	27.3	4	23.5

The relationship between Keirsey's four temperament types (ST, SJ, NT, NF) and their willingness to euthanize pigs is illustrated in Table 45. The responses of the employees are categorized from "most" to "least" with "some" designating a moderate response. A majority of the responses yield a moderate ("some") willingness to euthanize pigs in all the temperaments (ST, SP, NT, NF). Each of the temperaments indicates a high (Most) and a low (Least) score in each of the four temperaments. The SJ and the NF temperament types are the least willing to euthanize pigs.

Table 45. *Relationship Between the Willingness of the Employee to Perform Euthanasia and Their Temperament*

Willingness	Temperament							
	SJ		SP		NT		NF	
	N	%	N	%	N	%	N	%
Most	64	19.8	7	21.2	0	0.0	3	17.6
Some	147	45.4	19	57.6	6	54.5	8	47.1
Least	113	34.9	7	21.2	5	45.5	6	35.3

There is no significant relationship between the area of employment on the farm and the willingness of the employee to perform euthanasia.

Table 46. *Relationship Between the Willingness of An Employee to Euthanize and the Area They Work*

	Area of Work									
	Breeding		Farrowing		Nursery		Finisher		Total	
	N	%	N	%	N	%	N	%	N	%
Most	41	25	15	24	7	15	13	12	76	20
Some	74	46	26	41	20	42	57	50	171	46
Least	46	29	22	35	21	43	43	38	132	34
Total	161	100	63	100	48	100	113	100	385	100

There is a relationship between the area an employee works and their attitude toward euthanasia. Employees working in the farrowing area have a more negative attitude toward euthanasia (n=25, 40 percent). The breeding employees' attitude toward euthanasia is greater than one-third of the area employees (n=57, 35 percent).

Table 47. *Relationship Between the Area the Employee Works and the Employees Attitude Toward Euthanasia*

	Area of Work									
	Breeding		Farrowing		Nursery		Finisher		Total	
Attitude	N	%	N	%	N	%	N	%	N	%
Positive	44	28	13	20	12	25	48	43	117	30
Ambivalent	60	37	25	40	21	44	41	36	147	38
Negative	57	35	25	40	15	31	24	21	121	32
Total	161	100	63	100	48	100	113	100	388	100

$$\chi^2 = 14.839; df = 6; P > .05$$

Multivariate Model

A multivariate model was developed to determine if the combined effect of selected independent variables are related to the two dependent variables, attitude and willingness. The model used in the multivariate analysis consists of the following independent variables: race, gender, age, religion, and temperament of the employee, area of current employment, method of euthanasia used in the farrowing department, euthanasia method used in the nursery department, weight of the heaviest pig euthanized using blunt trauma, how the employee copes with stress after euthanasia, and how the employee was trained to perform euthanasia. The multivariate analysis was performed on independent variables found significant in the general linear model. The significant variables ($p < .05$) related to an employee's willingness to euthanize pigs include: method of euthanasia, age of the employee, area of work and gender of the employee related to attitude toward euthanasia.

The multivariate model considered the method of training (Table 48) in relationship to the employee's willingness to euthanize pigs. The preferred method of training was a company trainer ($p < .05$). Employees trained by the company trainer were more willing to perform euthanasia than those trained by any other method. Secondary to company trainer, the

farm manager method of training is perceived to be a better ($p < .05$) method of training with regards to employees' willingness to euthanize pigs than the use of company literature.

When the age of the employee was classified as younger or older than 40 years, age was related to his or her willingness to euthanize pigs. The information in table 49 reveals that farm employees over the age of 40 are less ($p < .05$) willing to euthanize pigs than employees under the age of 40.

Table 50 illustrates the different areas of employment on a farm with regards to an employee's willingness to euthanize. The breeding herd manager is more ($p < .05$) willing to perform euthanasia than to other management-level employees. The farm managers tended ($p < .1$) to be less willing to perform euthanasia than other department managers.

The gender of the employees is depicted in Table 51. There is a significant relationship between the gender of the employees and the employee's attitude toward euthanasia. The female employees have a more negative ($p < .05$) attitude toward euthanasia than male employees.

All other independent variables in the multivariate model were not related to the attitude of the employees toward euthanasia and/or the willingness of the employees to perform euthanasia.

Table 48. *Relationship Between the Method of Euthanasia Training and the Willingness of the Employee to Euthanize Pigs*

Eutrain	Willingness	Standard	Sign.
	LSMEAN	Dev.	
Company Trainer	5.51	.084	a
Farm Manager	4.90	.033	b
Company Literature	3.93	.176	c
Another Employee	4.70	.031	
No Training	4.69	.144	
Other	4.98	.113	

^{a b} Prob. < .05

^{b c} Prob. < .05

Table 49. *Relationship Between the Age of the Employee and the Willingness of the Employee to Euthanize Pigs*

Age	Willingness	Standard	Sign.
	LSMEAN	Dev.	
30 or Less	4.90	.039	a
30 to 39	4.87	.039	a
40 or More	4.45	.026	b

^{a b} Prob. < .05

Table 50. *Relationship Between the Area of Employment and the Willingness of An Employee to Euthanize Pigs*

Area	Willingness	Standard	Sign.
	LSMEAN	Dev.	
Breed Mgt	5.13	.020	a
Farm Mgt	4.11	.079	b c
Farrow Mgt	4.72	.085	c
Finish Mgt	4.95	.317	c
Nursery Mgt	4.94	.212	c

^{a c} Prob. < .05

^{b c} Prob. < .1

Table 51. *Relationship Between Gender and the Attitude of the Employee Toward Euthanasia*

Gender	Attitude	Standard	Sign.
	LSMEAN	Dev.	
1	71.30	.108	a
2	69.29	.192	b

^{a b} Prob. < .05

CHAPTER 5

CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

The findings related to the euthanasia study were presented in Chapter 4. A review of major findings, conclusions and implications is found in Chapter 5. Suggestions for further research in the area of swine euthanasia are discussed at the conclusion of this chapter.

Purpose and Review

As indicated earlier in the study, the euthanasia of sick and/or poor doing farm animals is a necessary part of farm life in order to eliminate pain and suffering. The ultimate goal of the swine worker is to perform the process as quickly and efficiently as possible. The definition of euthanasia is a quick and painless death (NPB, 2003). Even though euthanasia is necessary, the process is under constant scrutiny by various animal rights and animal welfare groups. Due to the emphasis placed on euthanasia in the livestock industry, the following research questions were chosen for this project.

The research questions include:

1. Which method of euthanasia, blunt trauma, electrocution, lethal injection, bolt gun, rifle or carbon dioxide gas, do employees prefer?
2. Does the employee perceive the pain of the pig an important factor when choosing a euthanasia method?

3. Do employees perceive safety as an important factor in performing euthanasia?
4. Which method of euthanasia, blunt trauma or carbon dioxide gas, do employees perceive as being the fastest method of euthanasia for the pig?
5. What method of euthanasia training do employees prefer?
6. Do employees perceive the time it takes to complete the euthanasia process as an important factor in choosing a method?
7. Do employees perceive the euthanasia of pigs as a stressful part of the job?
8. Is there a correlation between employee's temperament and his or her willingness to euthanize pigs and his or her attitude toward euthanizing?
9. Do selected socio-demographic factors influence an employee's attitude toward euthanasia and/or willingness to euthanize pigs?
10. Selected socio-psychological factors do have an effect on an employee's attitude and/or willingness to euthanize.
11. Do selected farm factors influence an employee's attitude toward euthanasia and/or willingness to euthanize pigs?

12. Do selected euthanasia methods influence an employee's attitude toward euthanasia and/or willingness to euthanize pigs?
13. Does a combination of independent variables in the multivariate model influence an employee's attitude toward euthanasia and/or willingness to euthanize pigs?

Major Findings and Conclusions

Conclusions 1: Blunt Trauma is the preferred method of euthanasia by the survey respondents. The first objective of this study is to determine which method of euthanasia, blunt trauma or carbon dioxide gas, employees prefer. There is evidence to suggest (n=286, 74 percent) that the current method of blunt trauma used to euthanize 1-12 lb. pigs is the most reported method. There is also evidence to suggest (n=250, 65 percent) that carbon dioxide gas appears to be less painful for the pig. Swine employees preferred not to hold the pig (n=175, 48 percent) while performing blunt trauma euthanasia. Another important finding that indirectly relates to an employee choosing the preferred method, is the willingness of the employee to choose a method that takes longer to perform if the new method causes less pain and stress for the pig (n=212, 55 percent). Choosing the preferred

method is closely associated with the welfare of the pig, not the speed of the process.

An assumption about the preferred euthanasia method revolves around the employee's understanding of the method that causes the least amount of pain for the animal. Even though blunt trauma (n=363, 93.6 percent) is the most predominantly used euthanasia method on surveyed farms, the respondents indicate they are willing to change the currently used method of farm euthanasia if the pig's welfare is improved by the change.

Conclusion 2: The respondents perceive pig pain as an important factor in which method of euthanasia to choose. The second objective involves the employees' perception of the amount of pain the pig endures during the euthanasia process as an important factor to consider when choosing a euthanasia method.

There is an overlap between objective one and objective two, as suggested in conclusion one. The perceived level of pain experienced by the pig could influence the method of euthanasia chosen by the employee. The pain of the pig is definitely important to farm employees when determining which euthanasia method to use. A large majority of the employees (n=334, 86.6 percent) agree that it is more humane to euthanize an animal than let it die naturally in pain. Finding time to complete all the daily tasks on a farm is important, but a majority of the employees (n=212, 55 percent) agree that

they are willing to use a method that took more time if the pig suffered less. The employees responded positively to the question about euthanizing a pig that is sick compared to euthanizing a pig that does not appear sick (n=275, 71.6 percent). Employees agree carbon dioxide gas euthanasia is less painful to the pig (n=250, 65.1 percent). Once an employee determines a pig is sick or in pain and will not recover, he or she does not get sad or upset (n=238, 61.8 percent) when euthanasia is performed. A large percentage of respondents (n=167, 43.2 percent) agree that euthanizing a pig that did not appear to be sick would cause them to feel sad or upset. Euthanizing a sick pig is less stressful for the employee.

Conclusion 3: Safety is perceived by the respondents as being an important factor in performing euthanasia. Safety issues are extremely important in all euthanasia processes. As discussed earlier in the literature review, different methods of euthanasia are used for various sizes of pigs (NPB, 1997). Many of the workers completing the survey (n=289, 74.5 percent) have worked in the farrowing department. A total of 363 respondents (93.6 percent) currently use the blunt trauma method to euthanize 1-12 lb. pigs. When survey respondents were asked about blunt trauma euthanasia being a safe method, they responded with an overwhelming positive response (n=300, 79 percent). A majority of the employees (n=212, 55 percent)

agree that carbon dioxide gas euthanasia would be a safer method than blunt trauma.

The bolt gun euthanasia method is considered a safe method of euthanasia to use on nursery pigs (n=244, 64 percent). A large number of respondents (n=176, 45.4 percent) have worked in a pig nursery for one week or more. There appears to be a problem with bolt gun euthanasia in nursery-size pigs due to the small area on the nursery pig forehead to place the gun and the lack of an efficient method to restrain the animal while performing the process. These are safety concerns expressed by Dr. David Bishop (Personal communication, March, 2004).

Conclusion 4: Blunt trauma method of euthanasia is perceived by the employees to be the fastest method of euthanasia. An ideal euthanasia process, by definition, is one that is quick and painless for the pig. The respondents agree (n=274, 71.2 percent) that the blunt trauma method of euthanasia is the quickest method.

The speed of completing the euthanasia process relates to the stress level of the respondents. A number of employees (n=176, 44.4 percent) agree that they deal with the stress of euthanasia by completing the process quickly.

The results reflect that the respondents perceive the increase in the speed of the euthanasia process as being less stressful for the employee and the pig.

Conclusion 5: Respondents prefer the on-farm method of euthanasia training. All aspects of swine production require some degree of training. Some areas of production involve more sensitive issues and could induce employee stress. These areas may require specialized supervision and training, they include medication techniques, specialized birthing and euthanasia processes.

The respondents agree (n=302, 79.3 percent) that more training in the euthanasia process would be helpful. A better understanding of the physiological aspects of euthanasia could improve job satisfaction as it relates to comfort level in dealing with pig euthanasia.

The employees' preferred training method is on-farm training (n=295, 76 percent). Hands-on training is considered to be the best training method.

The largest number of farm employees (n=208, 53.6 percent) currently receives euthanasia training from the farm manager. This suggests that farm managers should be updated periodically on current industry protocol and preferred methods of euthanasia.

Conclusion 6: The respondents agree time is an important factor to consider in choosing a euthanasia method.

Completing daily job functions in a timely manner is a concern on the modern swine farm. Due to farm budget restraints and restricted number of hours worked per week, the time allotted to each farm task is limited. Many short cuts are taken on a

daily basis to complete the required tasks. To determine if the employees were interested in reducing the amount of pain and suffering of the pig, the employees were asked if they would take more time to complete a particular method of euthanasia if the pig suffered less pain. An overwhelming majority of the respondents (n=310, 80.1 percent) agreed that they would use a method that took longer to complete if the pig had a less painful death.

This indicates that employees are interested in the pain and discomfort of the pig. Even though time is at a premium on the farms, the welfare of the pig is more important to the employees.

Female employees were more inclined to choose a less painful method of euthanasia (n=99, 86 percent) even though it would take more time. This compares to the male employees (n=205, 77 percent) responding to the same question.

The employees with less than high school education (n=112, 88 percent) are more willing to use a method that takes longer to perform than the employees with greater than a high school education (n=64, 72 percent).

Conclusion 7: There is a degree of stress associated with euthanasia, but the level of stress affects employees differently. Most occupations have stressful tasks that some employees dread performing. The seventh objective of this study is to determine if employees perceive pig euthanasia as being a stressful part of their job.

Approximately one-third of the respondents (n=145, 36.5 percent) agree that euthanasia is not stressful. Responding to the same question, the respondents agree that performing the euthanasia process quickly (n=176, 44.4 percent) is their way of coping with stress. Stress in daily jobs can be reduced by familiarity with tasks. Euthanasia falls in this category, with 65.3 percent of the respondents agreeing that euthanasia becomes easier the more times they complete the process.

Even though euthanasia is necessary, approximately one-half (n=178, 46.4 percent) responded that they wish they did not have to euthanize pigs. This could relate to some degree of employee stress.

Stress related to the physical process of holding a pig while performing euthanasia was surveyed. The respondents agree (n=175, 45.7 percent) that they do not like to hold the pig while euthanizing the animal. A less physical method that does not require the employee to hold the pig would help eliminate a degree of employee stress.

The perception regarding a pig's ability to recover and become viable are an important stress related factor for the employee. Only a small number of employees (n=94, 24.4 percent) get upset when they have to euthanize sick pigs, versus a larger percent (n=167, 43.2 percent) that become upset when they euthanize a pig that does not appear to be sick. A determination of sick versus not sick affects the degree of stress felt by the employee. The degree of pig

sickness is an educational issue and will be discussed in the recommendations.

In order to better understand the euthanasia stress factor, employees were asked if they could euthanize a sick family pet. A majority of the employees (n=222, 57.3 percent) agree that they could euthanize a sick family pet. The stress related factor involves a definition and employee understanding of the term "sick." The degree of stress appears to be reduced if the animal is perceived to be terminally ill.

The stress associated with euthanasia does not appear to leave the farm and filter into the employee's personal life. A large majority of employees (n=313, 81 percent) agree pig euthanasia does not affect their personal life.

The increased age of an employee does not appear to have an effect on employees' ability to euthanize pigs. A small percentage of employees (n=69, 18 percent) agree euthanasia gets harder with age. The fact that employee age is not a contributing factor in the acceptance of the euthanasia process could be related to the total years an employee has been euthanizing and the number of times the employee has euthanized pigs.

The Spanish-speaking farm employees are the least willing to euthanize pigs (n=59, 44 percent). The English speaking employees have a better tolerance (n=73, 29 percent) of the euthanasia process. Choosing a method of euthanasia more pleasing to the Spanish-speaking employees may increase their willingness to euthanize pigs. Choosing the correct euthanasia

method will be addressed in the recommendation section of the project.

Conclusion 8: There is a relationship between an employee's temperament and their attitude toward euthanizing and their willingness to euthanize pigs. The largest number of respondents that completed the Keirsey Temperament Sorter (n=324, 84 percent) exhibited an SJ temperament. The most significant number of respondents yielded the following personality types: ESTJ (n=139, 36.2 percent); ISTJ (n=64, 16.6 percent); ESFJ (n=70, 18.2 percent); ISFJ (n=50, 13 percent). The percent of responding swine employees reporting the SJ temperament (84 percent) is significantly higher than the over-all population reported by Keirsey (40-45) percent and Myers-Briggs (38 percent).

Yeske (1997) reported similar results. Yeske's data suggested the personality types represented in his farm worker study were ESTJ (14 percent); ISTJ (20.58 percent); ISFJ (8.83 percent) and ESFJ (8.82 percent). Yeske's study yields a combined SJ temperament of 53 percent of the farm workers. These results are closer to Keirsey's value of 40-45 percent of the overall population.

Yeske (1997) separated the survey results of the farm stockperson from the decision makers. The results were considerably different. The SJ temperaments among the decision makers were considerably higher than the farm stockperson. The decision makers in the Yeske's study yielded

a SJ temperament average of 69.8 percent. The temperament represented by the decision makers is much closer to the 84 percent represented in this farm employee study.

Yeske (1997) states, "the ESTJ profile types in short are described as life's natural administrators. This type is given to responsibility, productivity and results. They are outgoing, usually quite direct, and very upbeat to be around. They see the world in terms of hands-on, practical, and realistic situations. These perceptions are translated into objective, non-personal, analytical decisions" (p.182). The ESTJ personality types and the SJ temperaments as a whole are suited for working and managing high-producing swine production systems, which involve making decisions about piglet and employee welfare.

Employees with a preferred SJ temperament have a more negative attitude toward euthanasia (n=105, 32.4 percent) than the other three temperaments, SP, NT and NF.

Most of the employees represented by the four temperaments have an ambivalent response toward their willingness to euthanize pigs. There is an approximately equal number of employees responding positively and negatively toward the questions related to their willingness to euthanize.

The willingness to euthanize appears to be more closely associated to the employee's perception of the amount of pain caused to the pig. If the employee perceives the pain of the pig to be high during the euthanasia process, the willingness to euthanize the pig decreases.

The SP temperament has a slightly higher response on the "some" willingness to euthanize (n=19, 57.6 percent) than the other three temperaments, SJ (n=147, 45.4 percent), NT (n=6, 54.5 percent) and NF (n=8, 47 percent). The SP temperament is considered by Keirse (1998) to be aware of reality, adaptable, open-minded and tolerant.

Conclusion 9: Selected socio-demographic factors do have an affect on an employee's attitude and willingness to euthanize. There appears to be a difference in the attitude of the non-white employee's attitude toward euthanasia compared to the white employee. The non-white employees have a more negative attitude toward euthanasia than the white employees (n=79, 40 percent). The Spanish employees are less willing to euthanize pigs than the English speaking employees. The female employees appear to be more sensitive to the pain of the pig compared to the male employees. The female employees are more likely to choose a less painful method of euthanasia (n=99, 86 percent) than the male employees. Female employees have a more negative attitude toward euthanasia than male employees.

Conclusion 10: Selected socio-psychological factors do have an effect on an employee's attitude and/or willingness to euthanize.

The ESTJ (n=139, 37 percent) and ISTJ (n=49, 76.6 percent) personalities have the most positive to ambivalent attitude ambivalent to toward euthanasia. The ESFJ personality type has a more negative attitude toward euthanasia (n=52, 74.3 percent). The largest percentage of employees working on farms is represented by the ESTJ (n=139, 37 percent) and the ESFJ (n=70, 18.2 percent) personality types. A conclusion could be made that the largest percentage of employees working on swine farms is represented by the ESTJ personality type, which has a positive attitude toward euthanasia. The next largest group of employees, the ESFJs, has the most negative attitude toward euthanasia (n=27, 38.6 percent) and are the least willing to euthanize pigs. The employees with a SJ temperament type have a more negative attitude (n=105, 32.4 percent) toward euthanasia compared to the SP, NT, and NF temperament types. The NT temperament type is the least willing (n=5, 46 percent) to euthanize. Note, there is a small number of respondents in this category.

Conclusion 11: Farm factors do have an effect on an employee's attitude and/or willingness to euthanize pigs.

The longer an employee euthanizes pigs, the less willing he or she is to euthanize. Table 23 reveals that 39 percent of the employees are willing to euthanize with 1 year or less experience, compared to 8 percent of the employees with 4 or more years experience. There is a relationship between the area an employee works and his or her attitude toward euthanasia. The employees working in the farrowing area have the most negative attitude toward euthanasia (n=25, 40 percent). The employees working in the finishing area have the most positive attitude toward euthanasia (n=48, 43 percent). The finishing area deals with the larger animals that require less nurturing by the employee.

Conclusion 12: There is a correlation between the euthanasia method and an employee's attitude toward euthanasia and /or willingness to euthanize pigs. When employees are required to euthanize a pig that does not appear sick (Table 39), they shift from a willingness to euthanize to a non-willingness to euthanize (n=108, 53 percent). Employees with less willingness to perform euthanasia find the task easier to perform on sick pigs.

There is a relationship between the willingness of an employee to euthanize and using a less painful method of euthanasia. Employees with lower levels of willingness tend to use a less painful method of euthanasia (n=123, 40 percent).

Conclusion 13: Combinations of selected independent variables in the multivariate model do have an effect on an employee's attitude toward euthanasia and/or willingness to euthanize pigs.

It was somewhat confusing that variables such as gender and age did not directly influence the attitudes toward or willingness to perform euthanasia in pigs. Closer evaluation of the relationships indicated that employees older than 40 years of age were more reluctant to perform the task than younger employees. This, coupled with the relationships between training methods and the fact that some employees did not perceive euthanasia as being stressful, indicate that an appropriate superior/subordinate relationship aids in the willingness to perform euthanasia. A preference for a company trainer over company literature training method indicates a desire for hands-on training with a emphasis on verification that the process is completed correctly.

Recommendations to the Swine Industry

The following recommendations are based on the findings of the study.

Recommendation 1:

Employees who perform euthanasia should have the tools available to determine which pigs need to be euthanized. Careful consideration should be given to the process that determines which pig is sick enough to be euthanized. A step-by-step protocol should be developed for each pig age group, and proper training should be developed to ensure that each employee has a thorough understanding of the process. The euthanasia protocol should minimize pig suffering and guarantee a quick death.

The respondents agree that euthanizing a sick pig is not as stressful as euthanizing a pig that does not appear to be sick. Employees must have the confidence to determine that a pig will not recover and that euthanasia is the only alternative. A step-by-step procedure would help the employee make the determination of "too sick to recover" a more objective decision. The determination of which pigs to euthanize should not be the sole responsibility of the employee. A lack of company protocol allows for variation in the process from employee to employee. A company policy based on proven research and employee acceptance is less likely to be scrutinized by outside groups or misinformed employees. A company-approved and enforced -protocol dealing with

terminally ill pigs could help slow the spread of disease throughout the herd.

Recommendation 2:

Farm managers should determine which employees are less sensitive to the euthanasia process. There is a large percentage of employees (n=190, 49.4 percent) that would be willing to euthanize all the sick pigs on the farm if they got paid more or had more time off. Farm managers should train and utilize these employees to euthanize sick pigs and help eliminate the stress on employees that do not prefer to euthanize pigs. These employees could be chosen during the on-farm training process. Sensitivity to employee preferences could help reduce stress and job turnover.

Recommendation 3:

The American Association of Swine Practitioners and the Nation Pork Board recommend several methods of euthanasia for the swine industry. The employees in this study appear to be more interested in the welfare of the pig than in a particular method of euthanasia. It is recommended that farms try several methods prescribed by the American Association of Swine Practitioners and the National Pork Board to determine which method is perceived to be less stressful for the pig and employee. It is recommended that different euthanasia methods be tried for the different pig ages and production units.

Study results show that many employees are comfortable with euthanasia methods currently in use on the farm (n=286, 74 percent). However, due to the pig welfare concerns

expressed by the employees in this study, it is evident that workers are interested in and open to trying different euthanasia techniques.

The adoption of a euthanasia method should consider the higher sensitivity of the Spanish-speaking employees toward euthanasia.

Recommendation 4:

The nursery production phase is a uniquely difficult phase of production to euthanize due to the size of the pig. The recommended bolt gun euthanasia method presents problems with employee safety. Farms should explore the possibility of using carbon dioxide gas euthanasia for this age pig.

Survey respondents agree that carbon dioxide euthanasia appears to be less painful for the pig. A company-wide protocol should be developed for any type of euthanasia method. Employees should have specified, age-related euthanasia protocol training. The survey respondents prefer hands-on euthanasia training on the farm. The second preferred method of training is by video.

A combination of pre-employment euthanasia video training combined with on-farm training could help alleviate some of the stress associated with the euthanasia process. A complete understanding of tasks associated with the production of pigs in a large confinement unit could help reduce new employee job dissatisfaction and subsequent employee turnover.

Recommendation 5:

Training on the death and dying process could help alleviate stress associated with pig euthanasia. Questions continue to arise about "what the pig feels" during the process. Employees need training on involuntary muscle contractions and brain stem activity associated with euthanasia. The farm employees need to have a working knowledge of the dying process associated with a prescribed company euthanasia policy. Employees need to understand the importance of certain protocols, why they are enforced by the company and the importance of following them.

Recommendation 6:

A working farm euthanasia protocol would be helpful as a guide for new and incumbent workers. Employees must understand and follow a step-by-step procedure to ensure a fast and painless death for the pig and reduced stress for the farm employee. Farms within a company should follow the same protocol so employees could move within the company without having to learn new euthanasia procedures. This would involve a pre-employment training process for new workers and continuing education training for seasoned workers as the protocol changes.

Recommendation 7:

According to employee survey responses, the preferred method of training is on-farm training. The on-farm method allows the new employee to receive hands-on personalized training. The respondents prefer a company

trainer to conduct the hands-on instruction. A company trainer can concentrate on training techniques that facilitate different employee learning styles. The data reveal, employees want more training on euthanasia.

Future Research

Future euthanasia research is important in swine production to maintain a proactive approach to sensitive farm issues.

1. More research should be done on the possible stress associated with new employees entering the field of pig production. Other research should include areas that potentially promote employee stress and possible dissatisfaction with their job.
2. More research should be done concerning the use of carbon dioxide euthanasia on the nursery phase of production. Employees should be exposed to the correct procedures of carbon dioxide euthanasia. After employees have become familiar with the process, the employees should be surveyed to determine their level of satisfaction.
3. Further research should be done to determine which methods of euthanasia training should be utilized. Training methods using videos and DVDs and graphics combined with hands-on farm laboratory training incorporating company policies and protocols should be explored. Further research should include the necessity of updated euthanasia training for veteran employees.
4. Are certain employees on the swine farms more willing to euthanize? There is substantial evidence to indicate that the euthanasia process is stressful for

some individuals but less stressful for others. More research should be done to determine if employees less sensitive to euthanasia can be identified and trained to perform euthanasia on the farm, thus reducing the stress on employees that consider it to be an unpleasant task.

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APPENDIX A

EUTHANASIA PROJECT
Personal/Demographic Information

Education Highest Grade Completed (Circle):

1 2 3 4 5 6 7 8 9 10 11 12 GED College 1 2 3 4 Graduate 1 2 3 4

Male

Female

Ethnic Group:

White

Black

Hispanic

Asian

American Indian

Years working in the Swine Industry _____

Do you live on a farm?

Yes

No

Were you raised on a farm?

Yes

No

What type of farm do you work on?

F/W

F/N

F/F

Other

What are your hobbies?

Age Range:

< 20

20 - 30

30 - 40

40 - 50

50 - 60

> 60

Do you feel emotionally upset after euthanizing (killing) a pig? (nervous, sad, depressed, etc.)

Yes

No

APPENDIX B

Results of Focus Group

Personal/Demographic Information

Education Level

Education Level (years)	American		Hispanic		Total	
	N	%	N	%	N	%
	< 12	1	8	3	33	4
12	7	58	3	33	10	48
< 4	4	34	1	12	5	24
4 or >	0	0	2	22	2	9
Total	12	100	9	100	21	100

Gender

Gender	American		Hispanic		Total	
	N	%	N	%	N	%
Male	6	50	4	44	10	47
Female	6	50	5	56	11	53
Total	12	100	9	100	21	100

Ethnic

	N	%
White	6	29
Black	6	29
Hispanic	9	42
Total	21	100

Years Working in the Swine Industry

Years	American		Hispanic		Total	
	N	%	N	%	N	%
1 - 5	4	33	4	44	8	38
6 - 10	6	50	4	44	10	48
11 - 16	2	17	1	12	3	14
Total	12	100	9	100	21	100

Do You Live On A Farm?

	American		Hispanic		Total	
	N	%	N	%	N	%
Yes	1	8	1	11	2	10
No	11	92	8	89	19	90
Total	12	100	9	100	21	100

Were You Raised On A Farm?

	American		Hispanic		Total	
	N	%	N	%	N	%
Yes	4	33	2	22	6	29
No	8	67	7	88	15	71
Total	12	100	9	100	21	100

What Type of Farm Do You Work On?

	American		Hispanic		Total	
	N	%	N	%	N	%
Farrow/Wean	11	92	9	100	20	95
Farrow/Nursery	0	0	0	0	0	0
Farrow/Finish	0	0	0	0	0	0
Other	1	8	0	0	1	5
Total	12	100	9	100	21	100

Employee Age

Age	American		Hispanic		Total	
	N	%	N	%	N	%
< 30	5	42	3	33	8	38
30 - 39	2	16	3	33	5	24
40 - 49	5	42	2	22	7	33
> 50	0	0	1	12	1	5
Total	12	100	9	100	21	100

Do You Feel Emotionally Upset After Euthanizing Pigs

	American		Hispanic		Total	
	N	%	N	%	N	%
Yes	5	42	7	78	12	57
No	7	58	2	22	9	43
Total	12	100	9	100	21	100

APPENDIX C

Euthanasia Dissertation Project

Questions For Focus Groups

Personal/Demographic Information

- What is the highest-grade level you completed?
- Are you male or female?
- What is your nationality?
- How many years experience do you have working in the swine industry?
- Do you live on a farm?
- Were you raised on a farm?
- What type of farm do you work on? Example: Farrow to finish
- Do you enjoy hunting?

Focus group questions

- How do you feel about euthanasia?
- Are you comfortable euthanizing pigs?
 - * Sick/Well/How sick?
- Are you required to euthanize pigs?
- What methods are used on your farm?
 - * What do you think about these methods?
 - * Do you wish there were an easier method?
- Do you make the decision to euthanizing pigs?
 - * Do you have a problem making that decision?

- How do you feel about killing a pig that looks normal and well?
- Have you ever been unable to kill a terminally ill pig?
 - * Do you have the authority to make that decision?
- Do you have a sick pen?
 - * What is company policy on the use of the pen?
- Do you think growing up on a farm makes it easier to euthanize?
- Have you been hurt while trying to euthanize an animal?
 - * Were you hurt restraining the animal?
 - * Were you hurt completing the process?
- How would you like the euthanasia process to happen?
 - * Tools, Procedure, When, Who
- What do you consider the least desirable euthanasia process?
- Who euthanizes on your farm?
 - * One person, farm manager
 - * Is this person trained?
- What is your attitude toward downer sows?
- Have you ever loaded an animal that should have been euthanized?
 - * What motivated you to load the animal or euthanize?
 - * Was the pig normal and healthy?
 - * Are you comfortable with that decision?
- Have you seen the AVMA guidelines on euthanasia?

- Do you think training in the euthanasia process would help?
- Do you think there is a difference in killing a little pig, sow or boar?
- Have you ever been emotionally upset after killing an animal?

Open-ended questions?

- How would you solve the critical issue of pig euthanasia?
- What would you recommend to the swine industry as a solution?
- How could _____ make euthanasia easier?
- Do you think there could be a problem with on farm suicide?

APPENDIX D

EUTHANASIA SURVEY										
<i>Directions: Check, circle or fill in blanks as necessary.</i>										
Which of the following best describes your racial or ethnic identification?										
African American/Black	White	American Indian	Asian or Pacific Islander	Hispanic or Latino						
What is your gender?										
Male					Female					
What is the highest education level you have attained?										
less than 8 yrs	8 yrs	9 yrs	10 yrs	11 yrs	12 yrs	Associate Degree	Bachelor Degree	Masters Degree	Other _____	
Date of Birth: _____ / _____ / _____										
Do you currently euthanize or have you ever euthanized pigs on your farm?										
							Yes	No		
How many years have you been working on a farm where you had to euthanize (kill) pigs?										
1 or less	2-5	6-10	11-15	16-20	21 or more					
Who administered the euthanasia training? <i>(Circle all that apply.)</i>										
Farm Manager	Another Employee	Company Trainer	Company Literature/Video				Other	No Training		
What areas have you worked for one week or more?										
Breeding	Farrowing	Nursery	Finisher			Other _____				
When euthanizing pigs, I cope with the stress by:										
Talking It Over With Someone Else	Being By Myself		Doing It As Quickly As Possible			Euthanasia is Not Stressful		Other _____		
What method of euthanizing pigs is used on your farm for pigs 1-12 lb (<i>farrowing house pigs</i>)?										
Blunt Trauma (Slamming Pig)	Electrocution	Carbon Dioxide Gas		Lethal Injection		Other _____				
What method of euthanizing is used on your farm for pigs 13-40 lb (<i>nursery pigs</i>)?										
Blunt Trauma	Electrocution	Carbon Dioxide Gas		Lethal Injection		Bolt Gun		Other _____		
Rank the methods of euthanasia in order of safety for the employee. Rank 1 to 4 with 1 being the safest method for the employee.										
Blunt Trauma (Slamming Pigs) _____	Carbon Dioxide Gas _____		Bolt Gun _____		Rifle _____		Other _____			

What are the heaviest pigs you have killed by blunt trauma?					
1-10 lb	11-15 lb	16-20 lb	21-30 lb	31 lb or more	
If you receive future training on pig euthanasia methods, how would you like to receive it? (Circle all that apply.)					
In classroom	On farm	Video	Internet	Other _____	
After euthanizing pigs, I					
Feel sick to my stomach	Think about it all day	Am sad	Feel fine	Other _____	
What religious denomination do you consider yourself?					
Baptist	Catholic	Holiness	Methodist	Mormon	Muslim Orthodox Jew Presbyterian Other _____
<i>Directions: Put a check in the space, that most nearly reflects your feelings or attitude.</i>					
	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
I consider myself a religious person.					
Euthanizing pigs has become easier, the more I have to do it.					
The process currently used on my farm to euthanize 1-12 lb pigs is the best method.					
It is harder for a female employee than a male employee to euthanize a farrowing piglet 1-12 lb.					
Euthanizing a pig that is not sick is harder than euthanizing a sick pig.					
Carbon Dioxide Gas euthanasia appears to be less painful to the pig than blunt trauma.					
Blunt trauma euthanasia is quicker than Carbon Dioxide Gas euthanasia.					
I understand that euthanizing sick pigs is necessary, but I wish I would never have to do it again.					
I get upset (<i>sad, nervous, etc.</i>) after euthanizing pigs that <u>do not</u> appear to be sick.					
I get upset (<i>sad, nervous, etc.</i>) after euthanizing pigs that are sick.					
The hardest part of euthanizing a 1-12 lb. pig is the physical process. (Example: <i>slamming</i>)					

<i>Directions: Put a check in the space, which most nearly reflects your feelings or attitude.</i>	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
When using a bolt gun on a nursery pig, I do not like to look at the physical damage (<i>hole</i>) in the head.					
I do not like to hold a pig in my hand while I euthanize it.					
Blunt trauma of a farrowing pig 1-12 lb is a safe method of euthanasia.					
Carbon Dioxide Gas euthanasia is safer for the employee than blunt trauma or bolt gun.					
The bolt gun is a safe method to use when euthanizing nursery pigs.					
I would prefer to take longer euthanizing the pigs if they suffered less.					
Training on euthanasia techniques would be helpful.					
I could personally euthanize my family pet (<i>dog, cat</i>) if it was sick and had very little chance to recover.					
An employee that euthanizes pigs can also nurture pigs successfully in the farrowing house or nursery.					
It would not bother me if my job were to euthanize <u>all</u> the pigs that needed to be euthanized on a farm <u>every</u> day.					
It is more humane to euthanize animals that are terminally ill than to let them die naturally in their environment.					
My job of euthanizing pigs affects my personal and home life. <i>Example: I get angry, shout at family members, can't sleep, or drink too much....</i>					
Animals have rights.					
The older I get the harder it is to euthanize.					
Humans should have control over animals (all animals.)					
Yes No					
Do you currently work or have you worked in the past with the rescue squad or volunteer for emergency services?					
Did you grow up on a livestock farm?					

	Yes	No
Is euthanizing pigs considered a part of your job or has been a part of your job in the past?		
Have you ever had to euthanize a pig that did not appear sick (poor or slow performer?)		
If there were a method of euthanasia that was painless for the pig, would you use it even if it took more time to do?		
If the employee designated to euthanize all the pigs on the farm got paid more money or got more time off, would you want that job?		
Do you decide if a pig needs to be euthanized?		
Have you ever wanted to resign after euthanizing pigs?		
Have you ever been too attached (<i>working with the animal every day</i>) to an animal to euthanize it?		
I would like more training on which pigs to euthanize and when to euthanize them.		
Farm Employment		
<i>Directions: Check the correct box.</i>		
I currently work in (job position/title):		
Management		
Farm Manager	Farrowing Manager	Breeding Manager
Nursery Manager	Finisher Manager	Other _____
Trainee/Assistant/Supervisor/Technician		
Farrowing	Breeding	Nursery
Finisher	Other _____	
Service Person		
Farrow/Wean	Nursery	Finisher
Other _____		

APPENDIX E

The Keirsey Temperament Sorter II

Decide on answer **a** or **b** and put a check mark in the proper column of the answer sheet on page 10. Scoring directions are provided. There are no right or wrong answers since about half the population agrees with whatever answer you choose.

1 When the phone rings do you

(a) hurry to get to it first

(b) hope someone else will answer

2 Are you more

(a) observant than introspective

(b) introspective than observant

3 Is it worse to

(a) have your head in the clouds

(b) be in a rut

4 With people are you usually more

(a) firm than gentle

(b) gentle than firm

5 Are you more comfortable in making

(a) critical judgments

(b) value judgments

6 Is clutter in the workplace something you

(a) take time to straighten up

(b) tolerate pretty well

7 Is it your way to

(a) make up your mind quickly

(b) pick and choose at some length

The Keirsey Temperament Sorter II 5**8 Waiting in line, do you often** (a) chat with others (b) stick to business**9 Are you more** (a) sensible than ideational (b) ideational than sensible**10 Are you more interested in** (a) what is actual (b) what is possible**11 In making up your mind are you more likely to go by** (a) data (b) desires**12 In sizing up others do you tend to be** (a) objective and impersonal (b) friendly and personal**13 Do you prefer contracts to be** (a) signed, sealed, and delivered (b) settled on a handshake**14 Are you more satisfied having** (a) a finished product (b) work in progress**15 At a party, do you** (a) interact with many, even strangers (b) interact with a few friends**16 Do you tend to be more** (a) factual than speculative (b) speculative than factual**17 Do you like writers who** (a) say what they mean (b) use metaphors and symbolism**18 Which appeals to you more:** (a) consistency of thought (b) harmonious relationships**19 If you must disappoint someone are you usually** (a) frank and straightforward (b) warm and considerate**20 On the job do you want your activities** (a) scheduled (b) unscheduled

6 *Different Drummers***21 Do you more often prefer**

__ (a) final, unalterable statements __ (b) tentative, preliminary statements

22 Does interacting with strangers

__ (a) energize you __ (b) tax your reserves

23 Facts

__ (a) speak for themselves __ (b) illustrate principles

24 Do you find visionaries and theorists

__ (a) somewhat annoying __ (b) rather fascinating

25 In a heated discussion, do you

__ (a) stick to your guns __ (b) look for common ground

26 Is it better to be

__ (a) just __ (b) merciful

27 At work, is it more natural for you to

__ (a) point out mistakes __ (b) try to please others

28 Are you more comfortable

__ (a) after a decision __ (b) before a decision

29 Do you tend to

__ (a) say right out what's on your mind __ (b) keep your ears open

30 Common sense is

__ (a) usually reliable __ (b) frequently questionable

31 Children often do not

__ (a) make themselves useful enough __ (b) exercise their fantasy enough

32 When in charge of others do you tend to be

__ (a) firm and unbending __ (b) forgiving and lenient

33 Are you more often

__ (a) a cool-headed person __ (b) a warm-hearted person

8 Different Drummers**47 In trying circumstances are you sometimes** (a) too unsympathetic (b) too sympathetic**48 Do you tend to choose** (a) rather carefully (b) somewhat impulsively**49 Are you inclined to be more** (a) hurried than leisurely (b) leisurely than hurried**50 At work do you tend to** (a) be sociable with your colleagues (b) keep more to yourself**51 Are you more likely to trust** (a) your experiences (b) your conceptions**52 Are you more inclined to feel** (a) down to earth (b) somewhat removed**53 Do you think of yourself as a** (a) tough-minded person (b) tender-hearted person**54 Do you value in yourself more that you are** (a) reasonable (b) devoted**55 Do you usually want things** (a) settled and decided (b) just penciled in**56 Would you say you are more** (a) serious and determined (b) easy going**57 Do you consider yourself** (a) a good conversationalist (b) a good listener**58 Do you prize in yourself** (a) a strong hold on reality (b) a vivid imagination**59 Are you drawn more to** (a) fundamentals (b) overtones

The Keirsey Temperament Sorter II 9

60 Which seems the greater fault:

__ (a) to be too compassionate

__ (b) to be too dispassionate

61 Are you swayed more by

__ (a) convincing evidence

__ (b) a touching appeal

62 Do you feel better about

__ (a) coming to closure

__ (b) keeping your options open

63 Is it preferable mostly to

__ (a) make sure things are arranged

__ (b) just let things happen naturally

64 Are you inclined to be

__ (a) easy to approach

__ (b) somewhat reserved

65 In stories do you prefer

__ (a) action and adventure

__ (b) fantasy and heroism

66 Is it easier for you to

__ (a) put others to good use

__ (b) identify with others

67 Which do you wish more for yourself:

__ (a) strength of will

__ (b) strength of emotion

68 Do you see yourself as basically

__ (a) thick-skinned

__ (b) thin-skinned

69 Do you tend to notice

__ (a) disorderliness

__ (b) opportunities for change

70 Are you more

__ (a) routinized than whimsical

__ (b) whimsical than routinized

10 *Different Drummers***Answer Sheet**

Enter a check for each answer in the column for a or b.

a		b		a		b		a		b		a		b						
1			2			3			4			5			6			7		
8			9			10			11			12			13			14		
15			16			17			18			19			20			21		
22			23			24			25			26			27			28		
29			30			31			32			33			34			35		
36			37			38			39			40			41			42		
43			44			45			46			47			48			49		
50			51			52			53			54			55			56		
57			58			59			60			61			62			63		
64			65			66			67			68			69			70		

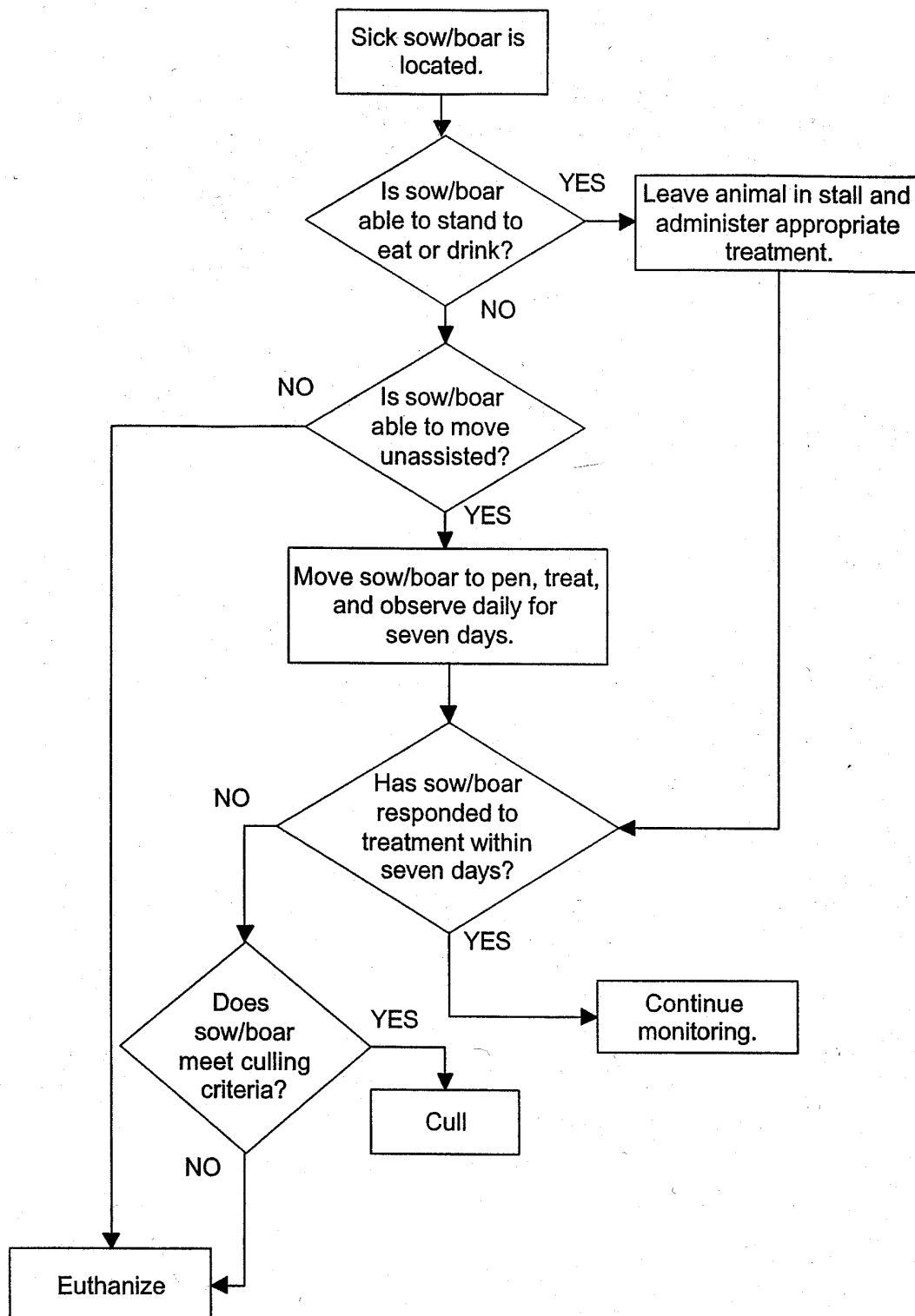
1		2		3		4		5		6		7		8	
	↓		→		↓		→		↓		→		↓		
1		2		3		4		5		6		7		8	
	E		I		S		N		T		F		J		P

Directions for Scoring

1. **Add down** so that the total number of a answers is written in the box at the bottom of each column (see next page for illustration). Do the same for the b answers you have checked. Each of the 14 boxes should have a number in it.

2. **Transfer the number** in box No. 1 of the answer grid to box No. 1 below the answer grid. Do this for box No. 2 as well. Note, however, that you have two numbers for boxes 3 through 8. Bring down the first number for each box beneath the second, as indicated by the arrows. Now add all the pairs of numbers and enter the total in the boxes below the answer grid, so each box has only one number.

APPENDIX F
EUTHANASIA DECISION TREE



APPENDIX G

Unit Three	STANDARD PROCEDURES	Section 3: Euthanizing Animals
COMPETENCE	PROCESS	NOTES
3.1 EUTHANIZING ANIMALS	<ol style="list-style-type: none"> 1. Determine that an animal needs to be euthanized because of management decisions. 2. Bring the animals outside if possible or at least in the aisle way. 3. Insert earplugs. 4. Unscrew the bolt gun and place a new shell in the chamber. 5. Screw it together. 6. One person will snare animal and one person will euthanize. 7. Snare animal. 8. Cock the gun. 9. Make an imaginary X from the animal's ear to its eyes, where the lines intersect is the spot to aim for. 10. Place the gun against this spot with the hole that the bolt comes out of toward the head. 11. Push the trigger. 12. The animals should fall down dead. 13. If the first time doesn't euthanize them repeat the process. 14. Place the second shot near the first within an inch. 15. Remove all ear tags. 16. When euthanized and removed, record on Removal Sheet. 17. Remove off scroll and farrowing rate report if animal is bred. 	<ul style="list-style-type: none"> • Bolt guns are used to euthanize and should be used with care. • A Dept. Head or Farm Manager must decide if an animal needs to be euthanized. • Some animals cannot walk outside and need to be euthanized where they are. • Safety: Ear protection should be worn to protect from loud noise when euthanizing. • Safety: Must have 2 people to euthanize animal. • Safety: To prevent animal from moving its head. (See Unit 1, Section 2.1 "Snaring Adult Swine.") • The bolt goes into the animal's brain and euthanizes them instantly without any suffering. • Safety: When an animal is first euthanized they kick and you need to keep clear of them. • Safety: Never point bolt gun toward anyone. • Rendering service discourages all non-body tissue. • Refer to Diagram #6 "PigCHAMP Death/Euthanize Removal Sheet".
SKILL TO BE TESTED: <i>*Euthanize one sow.</i>		

APPENDIX H

Company Protocol for Euthanizing Finish Pigs

Animal health is maintained by reducing stresses and preventing disease introduction to nursery pigs. This is accomplished by providing isolation from other animals, good nutrition, adequate water, sanitary conditions and correct room environments. However, occasionally there will be sick or injured animals that will need treatments. Procedures and treatments for sick or injured animals are listed below:

- a. Identify pigs for treatment during the A. M. Observation process.
- b. Treat pigs immediately after observation, prior to leaving nursery room.
- c. Identify problem (i.e. scours, off-feed, coughing, etc.) and consult Appendix—Treatment Protocol for correct drug therapy.
- d. Use dosage, frequency and duration shown in Appendix—Treatment Protocol
- e. If antibiotic is needed, treat animal for a minimum of 3 days. If no response to medication, try new antibiotic.
- f. Mark pig to identify treatment.
- g. Consult Unit Manager if illness or injury is severe.
- h. If animal does not respond to treatment and symptoms worsen, they must be humanely euthanized.
- i. Finishing pigs must be destroyed by the penetrating captive bolt method. This method will stun or kill depending on size, by concussive force and penetration into the brain.
 1. The Unit Manager should perform this procedure.
 2. Place animal near an exit (for ease of removal later). Do not take live animal outside to perform this procedure.
 3. Secure animal by rope or snare over the upper jaw held by an assistant.
 4. Assistant should always stand behind the shooter.
 5. Correct positioning is critical. The bolt should be directed at the midline of the forehead 1 finger width above eye level. See figure below for correct placement of penetrating captive bolt:



● Indicates placement for the penetrating captive bolt.

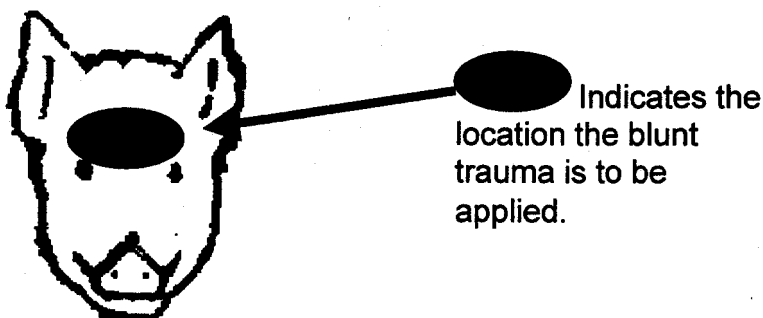
6. The penetrating captive bolt should be placed very firmly against the skull and directed upward approximately 20 degrees toward the brain.
7. The shot should render the animal unconscious. If not, repeat the shot.

8. After the animal is unconscious, sever the carotid (neck) or brachial (armpit) artery.
 9. After several minutes, the animal may be removed.
 10. Wash area
- Dead Animal Disposal for remaining actions to take.

APPENDIX I**Company Euthanasia Protocol for 1-12 lb Pigs****Piglet Treatments**

Piglet health is maintained through proper milk intake, crate sanitation and a comfortable environment. Occasionally there will be sick or injured piglets that will need antibiotic treatment. Perform the following:

- a. Identify problem (scours, injuries, swollen joints, greasy pig, etc.) and consult Appendix—Farrowing Treatment—Piglets for correct drug therapy.
- b. Use dosage, frequency and duration as shown.
- c. If antibiotic is needed, treat animal for minimum of 3 days. If no response to medication, try new antibiotic.
- d. Complete the following treatment information on the Farrowing Card: DATE, TEMPERATURE, DOSE, DRUG, AND REASON. Follow-up treatments are noted with checkmarks in appropriate boxes.
- e. Consult Unit Manager if illness or injury is severe.
- f. If animal does not respond to treatment, it must be humanely euthanized.
- g. The method of euthanasia for farrowing piglets less than 12 pounds is the blunt trauma method as follows:
 1. Administer a sharp, firm blow with a heavy, blunt instrument, on the top of the head, over the brain.
 2. It is essential that the blow be administered swiftly, firmly, and with absolute determination.
 3. If there is any doubt whether the pig is dead, the blow should be repeated.



APPENDIX J**Operating Procedures For Euthanasia Cart**
Off-Site Nursery Farms

Daily observation and maintenance of animal health and welfare is a major responsibility of the farm manager and farm personnel. Unfortunately, some animals develop conditions that cannot be cured. Euthanasia is the only humane treatment for an incurable condition.

1. Establish a well-ventilated area for CO₂ container storage and euthanasia area (hallway, load-out area, outside).
2. Gather pigs to be euthanized in the cart provided. Do not overfill the box (3-5 20lb pigs or 2-3 50lb pigs maximum).
3. Connect CO₂ line from the tank to the bottom of the box, put lid on box and attach straps.
4. Turn on CO₂ valve 1/4 turn for approximately 10 seconds. CO₂ is heavier than oxygen and will remain at the bottom. Keep lid closed for at least 5 minutes.
5. Some reflex kicking and scratching occurs, but the pig is unconscious.
6. Pigs should be euthanized within 5 minutes. If not, repeat procedure.
7. A good rule of thumb is as the ice on the inlet pipe thaws sufficient time has elapsed.
8. Check pigs for breathing and eye reflexes to make sure they are dead.
9. Farm managers or trained personnel are only allowed to apply this procedure.
10. Call for assistance if a problem occurs.
11. Do not run out of CO₂.
12. **DANGER!!!! NEVER USE OR STORE CO₂ TANK IN A CLOSED, POORLY VENTILATED AREA. CO₂ MAY CAUSE SEVERE ILLNESS OR DEATH IN THESE CONDITIONS.**

APPENDIX K

Animal Euthanasia Guidelines September 2003

Purpose: Establish guidelines and procedures for euthanasia of animals to prevent inhumane treatment and suffering of animals.

Guidelines: The following criteria can be used as a guide to determine if a pig should be destroyed. Animals meeting one or more of the following criteria should be euthanized. Euthanasia of poor doing pigs daily will encourage better herd health by lowering disease challenge.

1. Weight loss of more than 25%.
2. Extreme weakness or inability to eat and drink persisting for 24 hours or more.
3. Infections that affect more than one area and do not respond to treatment.
 - a. Several swollen joints
 - b. Weight Loss and swollen joints
 - c. Greasy pigs with swollen joints
4. Severely anemic pigs (pale appearance) from blood loss.
 - a. Gastric ulcers, bleeding wounds.
5. Pigs with congenital or acquired deformities that will not thrive.
 - a. Umbilical and Scrotal Hernias
 - b. Broken or dislocated limbs.
6. Pigs with conditions resulting in uneconomical production (runts, dwarfs, culls).

Euthanasia Methods (adapted for on farm use and approved by law enforcement, National Pork Board, American Assoc. of Swine Veterinarians, American Veterinary Medical Assoc.)

Pig Age	Weight	Suggested Method	Alternative Methods
<21 days	<12 lb	CO ₂ , Blunt Trauma	
21-70 days	12-60 lb	CO ₂	Captive Bolt, Gunshot
>71 days	>61 lb	Captive Bolt	Gunshot

*These methods are for regular or normal use. Natural disasters, accidents, and human safety may necessitate the use of other methods not listed.

APPENDIX L

Memo

To: Swine Farrowing Employees
From:
CC:
Date: 1/1/2001
Re: Rifles on Swine Farrowing Farms

As you are aware we have purchased Schermer Stunners (bolt guns) for each farm that will replace the rifles that were being used to dispatch sows and boars.

Effective immediately the Schermer Stunner will be used to dispatch sows and boars.

You must turn your rifle into _____ at the warehouse on or before Friday, January 26, 2001. Failure to turn in your rifle will result in disciplinary action being taken.

Anyone that dispatches an animal with a rifle after Friday, January 26, 2001 will be subject to termination of employment.

If you have any questions, please contact me.

APPENDIX M

It is inevitable that in every swine production system, animals will become ill or injured in such a way that euthanasia will be necessary. Since it is usually impossible or impracticable for the veterinarian to be available for all euthanasia on-farm, producers themselves often need to perform humane euthanasia of pigs.

When making decisions regarding ill or injured pigs, producers must consider pig welfare, economics, and public health. This brochure is designed to aid producers in making the appropriate decisions regarding euthanasia of swine. Swine producers and their employees should read this brochure. The action plan should be reviewed annually with a veterinarian and all employees.

The final decision for action on any ill or injured pigs usually falls into 4 broad categories:

1. **Treatment**-If an appropriate medical treatment is available.
2. **Slaughter**-If the animal is suitable for transport and human consumption.
3. **Sell or Transfer**-This option may be appropriate in case of injured or disadvantaged pigs that may perform adequately in a different production setting.
4. **Euthanasia**-Humane euthanasia may be the best option for various pig welfare, economic, and public health reasons.

As shown in Table 1, there are various methods of humane euthanasia in pigs. The first step is to consider which methods might be considered in each phase of production for each particular farm. Table 2 outlines the considerations for specific methods of euthanasia.

Table 1: Size-related Appropriateness of Various Euthanasia Methods in Swine

	Farrowing pig less than 3 weeks (12# or 5.5 kg)	Nursery pig less than 10 weeks (70# or 32 kg)	Grower pig (less than 150# or 68 kg)	Finisher pig greater than 150# or 68 kg)	Mature animal, sows or boars not practical
Carbon Dioxide (CO ₂)	yes	yes	not practical	not practical	not practical
Gunshot	no	yes	yes	yes	yes
Captive Bolt	no	yes	yes	yes	yes
Electrocution	yes	yes	yes	yes	yes
Anesthetic overdose	yes	yes	yes	yes	yes
Blunt trauma	yes	no	no	no	no

*CO₂ means Carbon Dioxide, NOT Carbon Monoxide (CO). Carbon Monoxide is a method of euthanasia but is not currently recommended because of its high potential as a human health hazard.

Considerations for euthanasia:

When humane euthanasia is the most appropriate option, the following considerations must be made when choosing the appropriate method:

- **Humane safety:** the method must not put producers or their employees at unnecessary risk.
- **Pig welfare:** The method should minimize any pain or distress on the animal.
- **Practicality/technical skill requirements:** The method should be easily learned and repeatable with the same expected outcome.
- **Cost:** the method should be economical for the producer.
- **Aesthetics (degrees of unpleasantness for the observer):** The method should not be objectionable to the person administering the procedure.
- **Limitations:** Some methods are only suitable for certain sizes of pigs or certain locations.

Table 2 outlines specific euthanasia methods with regards to the above consideration.

Details of Table 2

1. **Carbon Dioxide (CO₂)**—CO₂ causes rapid onset of anesthesia with subsequent death due to respiratory arrest. It is very safe for personnel, low in flammability and relatively inexpensive. The main disadvantage is that swine may demonstrate transient muscle spasms prior to death. This effect is probably a physiologic response after onset of anesthesia rather than an indication of emotional stress or negative pigs than stress gene positive pigs.

CO₂ is heavier than air, therefore when constructing a container for swine euthanasia the outlet valve should be located at the top so that the container can be completely filled with CO₂ while air is allowed to escape. For small pigs a garbage can with the inlet and outlet valves installed in the lid plus a plastic bag liner can be used. After checking for complete euthanasia, the bag containing the pigs can be removed.

2. **Gunshot and penetrating captive bolt**—These methods stun or kill depending on size, by concussive force and penetration into the brain. Use in adult animals may only stun, therefore it is recommended that the carotid (neck) or brachial (armpit) artery be severed once the pig is stunned. Both methods are practical when used by an experienced person. Extra care must be taken to insure human safety when using firearms. The user should be trained in firearm safety and understand the potential for ricochet. A .22 caliber rifle is most commonly used. Shotguns are sometimes used to reduce the potential for ricochet. Animals should be secured by a rope or snare over the upper jaw held by an assistant. The assistant should always stand behind the shooter. If using gunshot, the animal should be restrained outside of the building on soil where danger from ricochet is reduced.

Correct positioning for this method is critical. The shot should be directed at the midline of the forehead 1 finger width above eye level. The penetrating captive bolt should be placed very firmly against the skull and directed upward approximately 20° toward the brain. A charge large enough to cause the bolt to penetrate the skull of a sow or boar should be used (0.22 3gr Green cartridge). The gunshot method requires that the firearm to be held

about 2 to 10 inches from the skull at the same position described for penetrating captive bolt.

3. **Electrocution**—Electrocution is also considered a humane form of euthanasia. It induces death by insensibility of the brain followed by cardiac fibrillation, which causes cerebral anoxia (no oxygen to the brain). A two step procedure is recommended for euthanasia by electrocution.

First the pig must be rendered unconscious. If electrical stunning is used, electrodes must be placed on opposite sides of the head so that current travels through the brain. Secondly, the current should be redirected through the heart of the unconscious pig to induce cardiac fibrillation. This will ultimately result in cerebral anoxia and death. Some literature may refer to a one step procedure, colloquially known as the "head to leg" procedure where unconsciousness and cardiac fibrillation are simultaneously induced. This method is currently approved in other countries, but the American Veterinary Medical Association. Methods where the current is directed only to the heart are not acceptable.

For large market weight hogs, the minimum of 1.25 amps at 300 volts for 1 second should be used. When properly applied, electrical stunning induces instantaneous unconsciousness.

The biggest disadvantage of electrocution is the hazard to human safety if proper lock out

Below is an example action plan for a swine herd.

Euthanasia Action Plan

Farm Name: *XV3 Farm*

procedures are not in place. For both humane and safety reasons a commercially available hog stunner should be used as a power source. This apparatus contains an isolation transformer which improves electrical safety and provides sufficient amperage to instantly induce unconsciousness. Electrocution is not a useful method for euthanasia of multiple animals because it requires too much time per animal.

4. **Anesthetic overdose**—Barbiturates and pentobarbital combinations are used to depress the central nervous system, causing deep anesthesia progressing to respiratory and cardiac arrest. This is considered a very humane form of euthanasia but it does require intravenous injection into the animal. Federal drug regulations require the drugs to be bought, stored, and used under supervision of an individual registered with the US Drug Enforcement Administration (DEA). These animals must be properly disposed of according to state law.

5. **Blunt trauma**—This is a humane and economic method but may be objectionable to the person administering the method. A sharp, firm blow with a heavy blunt instrument on the top of the head over the brain is an effective way of humanely killing pigs less than 2 weeks of age. It is essential that the blow be administered with determination and swiftly and firmly enough to ensure quick, humane euthanasia and not just stunning.

Date: *Month/Day/Year*

Drafted by: *Joe Smith, producer—Dr. John Doe, veterinarian*

Phase of Production	Euthanasia method of choice	Alternative method of euthanasia
Farrowing piglets (<12lb or 5.5kg)	<i>CO₂ chamber</i>	<i>blunt trauma</i>
Nursery (<70lb or 32kg)	<i>Penetrating captive bolt</i>	<i>gunshot</i>
Grow/Finish (up to 300lb or 136kg)	<i>Penetrating captive bolt</i>	<i>gunshot</i>
Mature animals (sows, boars)	<i>Penetrating captive bolt</i>	<i>gunshot</i>

Work with your veterinarian to outline a plan stating which method of euthanasia will be used during each phase of production on your farm. Attention must be paid to the potential for pathogen spread when selecting a method of euthanasia of pigs on your farm. Remember to review the plan with any new employees and annually as a reminder to all.

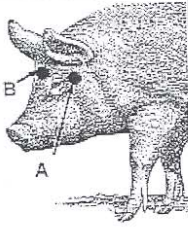
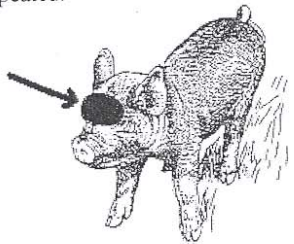
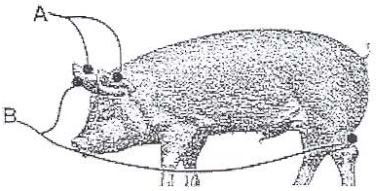
Captive Bolt/Gunshot	Blunt Trauma Method	Electrocution Method
<p>Figure 1: Humane destruction of pigs. "A" indicates recommended position for temporal method. (Suitable for firearm only.) "B" indicates recommended position for frontal method, at the appropriate angle (Suitable for firearm or captive-bolt pistol).</p> 	<p>Figure 2: Humane destruction of pigs. A sharp, firm blow with a heavy, blunt instrument, on the top of the head, over the brain, is an efficient way of humanely killing pigs less than three weeks of age. It is essential that the blow is administered swiftly, firmly and with absolute determination. If there is any doubt whether the pig is dead, the blow should be repeated.</p> 	<p>Figure 3: Electrocution electrode placement "A" indicates correct position for Step 1 to render the animal unconscious. "B" indicates correct position for Step 2 to induce cardiac fibrillation.</p> 

Table 2: Specific Euthanasia Methods for Swine						
	Human Safety Risk	Pig Welfare	Skill Required	Cost	Aesthetics	Limitations
Carbon Dioxide	low, use in well ventilated area	good, causes respiratory arrest, used in some packing plants	low	moderate, initial cost of equipment CO ₂ supply	very clean procedure some terminal movements possible	may only be practical for small pigs
Gunshot	moderate to high, training needed, security of firearms	good, correct placement essential	moderate	moderate, initial cost of firearm, ammunition	discharge of blood from wound	some skills and training required, not for small pigs
Penetrating Captive Bolt	moderate to high, training needed	good, correct placement essential	moderate	moderate, initial cost of captive bolt gun	discharge of blood from wound, should be followed by severing a major artery in adult animals	some skill and training required, not for small pigs
Electrocution	low if proper lock out/tag out procedures followed and commercial hog stunner used	good, immediate unconsciousness followed by cardiac fibrillation	low, proper training required	low after initial cost of proper electrical system	muscle contraction due to electricity	300 V electricity and proper lock out/tag out essential, commercial hog stunner recommended
Anesthetic Overdose	low if assistance for holding is available	good, anesthesia followed by respiratory and cardiac arrest	high, proper training for intravenous injection essential	high, FDA regulations and control apply	terminal gasping is possible	applicable agents available only to licensed veterinarian, carcass disposal
Blunt Trauma to Head	very low	good if performed in small pigs with rapid force strong enough for instantaneous death	low, proper training required	none	may be emotionally unacceptable	only applicable to small pigs

Euthanasia Action Plan

Farm Name: _____

Date: _____

Drafted by: _____

Phase of Production	Euthanasia method of choice	Alternative method of euthanasia
Farrowing piglets (<12lb or 5.5kg)		
Nursery (<70lb or 32kg)		
Grow/Finish (up to 300lb or 136kg)		
Mature animals (sows, boars)		

Conclusion

Regardless of the method used, personnel should work with their veterinarian to be trained to check for cessation of corneal reflex, respiration, and heart beat to confirm the death of the pig. Details of each technique are included to allow you to design an appropriate plan for euthanasia during the various stages of production. All of the methods listed in this brochure are considered humane for the pig when properly performed within the limitations listed. Methods selected and disposal of euthanized animals must be according to state law.



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