

# **NPB FINAL RESEARCH GRANT REPORT**

**Project Title and NPB project identification number:** Validation and Application of a Survey of On-Farm Hispanic Worker Attitudes Towards Pig Euthanasia (IRB2019-225)

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## **Industry Summary:**

Failure to euthanize sick/injured pigs leads to animal suffering, compromises animal welfare, and leads to financial losses due to retaining unprofitable animals in the herd and through audit failures. The Common Swine Industry Audit considers the lack of timely euthanasia as a critical failure, as it compromises animal welfare. Additionally, consumers demand high welfare standards that producers must provide to stay competitive in the market.

We utilized direct measurements of employee well-being using empirically-validated mental health scales and structured focus groups led by an animal welfare scientist who trained bilingual moderators. Through an interdisciplinary to ensure that the outcomes directly led to effective and efficient solutions to performing timely euthanasia in the swine industry.

The purpose of the study was to **1) Develop and validate surveys for caretakers'/workers' attitudes towards pig euthanasia, 2) Use the developed survey materials to assess caretakers/workers in the different barn units, 3) Utilize focus groups to better understand the underlying psychological impact on caretakers when performing on-farm euthanasia that may not have been identified by the surveys, and 4) To establish a framework on which future intervention strategies based on our findings can be used to improve animal welfare, caretaker morale/mental health, and job satisfaction.**

This study used an 83-item survey instrument developed to identify caretakers' attitudes toward pig euthanasia. The instrument included five survey sections: **1) Demographics, 2) Swine Management, 3) The Impact of Event Scale-Revised (Bride et al., 2007) , 4) The Professional Quality of Life Scale (ProQOL, 2009) and 5) The Moral Injury Event Scale (Nash et al., 2014).**

A total of 175 participants completed the survey, and group sizes varied between 7 and 18 caretakers per farm. In total, 12 outliers and extreme values were removed. Therefore, we were able to use 163 participant surveys.

The demographics results showed that 65.6% of the participants were male, 31.9% were female, and 2.5% preferred not to respond. A total of 96.9% of participants were from Mexico. About 84% of the participants had a university education level, 11.7% did not have a formal education, and 4.3% preferred not to respond. A total of 57.7% of the participants were veterinarians, 20.9% were Agricultural Engineers, 20.4 % belonged to another area of education, and 19% preferred not to respond. Ethnic background and gender affect employee attitudes toward euthanasia.

Approximately 50% of the participants had worked in the swine industry before and worked in the swine industry from 13-48 months. The other 50% was split between two groups that had been working in the industry for 0-12 months and 49 or more months. A total of 62% of participants reported they worked in a farrowing unit, 25.2% worked in the breeding unit, and 11% worked at both units simultaneously.

The relationship between the Swine Management Section and Demographic Section showed a significant difference between Common Swine Industry Audit knowledge and the time working in the swine industry. Participants with more than a year of experience in the swine industry were more likely to know about the CSIA (Common Swine Industry Audit), whereas 82.05% of caretakers with less than a year of experience do not have knowledge of the CSIA. However, over a quarter (28.26%) of the most experienced (more than 49 months in the industry) caretakers were not aware of this audit. Euthanasia decision-making varied, and confidence to perform this task increased with experience in the swine industry. Another noteworthy finding indicated that 59.85% of the caretakers with less than a year in the industry do not feel capable of identifying and performing the euthanasia process themselves, while 21.74% of most experienced caretakers do not feel capable of identifying and euthanizing compromised pigs themselves. This data indicates that caretakers with more experience working with pigs and performing euthanasia are more able to identify and conduct this the euthanasia process but some individuals still struggle, no matter the amount of experience.

Participants' responses also showed a significant difference between Common Swine Industry Audit knowledge and the farm work unit. More than half (53%) of the farrowing caretakers did not have knowledge of the CSIA. In comparison, 26.83% of the breeding area and 27.78% of caretakers working in both areas do not know about the CSIA. The significant results between the farm work unit and CSIA awareness may be due to the different tasks caretakers perform during their daily walking inspections and practices in their unit, so their knowledge may differ.

The results indicated a significant difference in the relationship between caretakers that found it easier if someone else identified the compromised pigs for them and they themselves followed up with euthanizing the pigs in comparison to caretakers having to identify the pigs and perform euthanasia themselves. The differences were observed to be based on education level. Most caretakers (83.21%) with a university degree did not consider it easier if someone else identified the compromised pigs for them, so they could follow up and perform euthanasia. Whereas, 42.11% of those without a university education consider it easier if someone else identifies the compromised pigs and they themselves perform euthanasia.

Results for gender presented significant differences related to Satisfaction and Stress. Satisfaction scores for males were higher than for females. On the other hand, Stress scores for males were lower than for females. These results support significant gender differences when performing pig euthanasia. In general, women caretakers showed higher stress and lower satisfaction than males. Women's stress and job satisfaction may be affected by external events in their daily behaviors and development.

Stress was negatively correlated with the professional quality of life scales, which may imply that swine caretakers in this study are also affected by moral stress.

Focus groups were utilized to complement the quantitative information and better understand the underlying psychological impact on caretakers when performing on-farm euthanasia that may not have been identified by the surveys. In total, 85 individuals were grouped into 11 focus groups based on the farm they worked on. The questions for the focus groups were developed based on the quantitative survey results. The questions implemented in the interview allowed the researchers to follow a line-up questioning.

The same participant sample for the quantitative phase were invited to participate in the focus group after their work shift. Results showed factors such as reasons for swine caretakers' stress, the importance of work experience to perform euthanasia, and potential training to improve caretakers' mental health.

After the focus group data was analyzed, three themes emerged from the data, (1) reasons for swine caretakers' stress, (2) the importance of work experience to perform euthanasia, and (3) potential training to improve caretakers' mental health.

Focusing on caretakers with difficulty making euthanasia decisions, less experience in the field, and increasing participation and understanding of effective euthanasia practices were identified as important. Establishing a framework for strategies based on gender weaknesses and inequality providing welfare to the animals but considering workers' mental health was also a topic of high relevance. Training for women caretakers performing euthanasia, looking for ways to help understand how stress and transgressions affect caretakers' on a daily basis, understanding personal and work life factors and the stress associated to these, and providing skills that may reduce negative mental health effects of workers are critical.

Lastly, some potential training topics that were identified in the focus groups were related to fear of getting hurt on the job when performing euthanasia and thanatology therapy was commonly mentioned by the participants. Psychological monitoring may help swine caretakers improve their emotional intelligence in performing euthanasia decisions. Caretaker work recognition was mentioned several times by the workers as something they would like management to implement, so that workers know when they are performing up to standard. Work recognition may be a motivation and a way to improve job satisfaction and reduce stress. Participants express they do not like to euthanize pigs, but they do know it is necessary to reduce animal suffering. Caretakers also mentioned the interest and importance of including mental health in their work. Overall, these results give us the opportunity to develop future interventions to improve swine caretakers' mental health. Therefore, this work will shed light on how human mental health can contribute to the enhancement of animal welfare practices on-farm.

### **Key Findings:**

- Five-section (83-item) instrument was developed and validated to identify swine caretakers' attitudes toward pig euthanasia.
- The Impact of the Event Scale was not considered constructive for inferential analysis in this study as the analyzed data did not demonstrate variability ( $M = 1$ ,  $SD = 0$ ).

- Work experience, education level, and farm work unit influenced the caretakers' euthanasia performing abilities/practices. Factors such as confidence, knowledge, responsibilities, and willingness to euthanize differ based on education level.
- Gender showed significant differences by showing higher job satisfaction for males and higher stress for females ( $p < 0.05$ ).
- The focus group analysis identified important barrier that affect timely euthanasia, such as reasons for swine caretakers' stress, the importance of work experience to perform euthanasia, and potential training to improve caretakers' mental health.

**Keywords:** Euthanasia, Common Swine Industry Audit (CSIA), North American Free Trade Agreement (NAFTA) visa, Hispanic Workforce, Transgressions, Betrayal

**Scientific Abstract:** On-farm pig euthanasia considers aspects of welfare and economics, but few comprehensive guidelines are available for swine producers, and further; do not consider cultural barriers. Euthanasia requires the ability to identify compromised pigs, technical skills, and willingness to euthanize pigs. In addition, timely euthanasia is part of the Common Swine Industry Audit (CSIA) and, thus, can lead to failed audits. The U.S. swine industry employs a high percentage of Latin American workers some that are U.S. residents/citizens and others through non-immigrant North American Free Trade Agreement (NAFTA) visas. These workers vary in their degree of education and swine industry experience. The Hispanic workforce largely represents the bulk of agricultural workers. Proper training of this workforce and identification of the barriers associated to performing timely euthanasia are critical. The objectives of this study were to: 1) Develop and validate surveys for caretakers'/workers' attitudes towards pig euthanasia. 2) Use the developed survey materials to assess caretakers/workers in the different barn units, 3) Utilize focus groups to better understand the underlying psychological impact on caretakers when performing on-farm euthanasia that may not have been identified by the surveys, and 4) To establish a framework on which future intervention strategies based on our findings can be used to improve animal welfare, caretaker morale/mental health, and job satisfaction. This study used an 83-item survey instrument that included five survey sections: **1) Demographics, 2) Swine Management, 3) The Impact of Event Scale-Revised (Bride et al., 2007) , 4) The Professional Quality of Life Scale (ProQOL, 2009) and 5) The Moral Injury Event Scale (Nash et al., 2014).**

In total 16 farms were surveyed in the State in of Iowa, in which 163 workers were eligible for this study. The demographic and swine management survey data were analyzed using a Chi-Square test, indicating that employees with less time working in the farm showed less CSIA knowledge, lower ability to identify pigs that needed to be euthanized, lower willingness to perform euthanasia on their own, and preferred not to have the responsibility of telling others when to euthanize a pig ( $p < 0.001$ ). Spearman's rank-order correlations with The Professional Quality Of Life (ProQOL, 2009) and the Moral Injury Event Scale (Nash et. al, 2014) indicated that stress and transgressions were the most frequently correlated scale, related to burnout, betrayals, and worker satisfaction ( $p = .022$ ). A Mann-Whitney U test determined gender differences, presenting a high level of stress ( $p = .026$ ) and a low level of satisfaction ( $p = .015$ ) in females and the opposite results in males. The focus group analysis results showed that there was a need to address/reduce swine caretakers' stress, the importance of work experience to perform euthanasia, and potential training to improve caretakers' mental health. This study emphasizes and concludes that the swine

industry must identify factors that decrease or negatively affect the employees' ability to perform timely euthanasia but take cultural barriers into account in order to provide efficient training programs and to improve best practices in the swine industry. Such as the need to take mental health into perspective in order to help workers cope with trauma for bad experiences or feelings of fear, training caretakers to identify and perform euthanasia confidently and competently, focus on personnel with difficulty making euthanasia decisions and less swine experience, and improve participation in and understanding of effective euthanasia practices.

**Introduction:** According to the National Pork Board (NPB), euthanasia is defined as the humane process whereby the pig is rendered unconscious, with minimal pain and distress, until death. The word "euthanasia" is derived from the Greek terms "eu," meaning good, and "thanatos" meaning death, defining euthanasia as good death (NPB, 2016). Euthanasia decisions for animals manifesting signs of disease or distress (referred to as compromised pigs) should be made as early as possible and be based on the severity of the animal's condition, previous treatment knowledge, observation, and transport for slaughter or removal to another location for diagnostic purposes (Turner & Doonan, 2010).

Euthanasia is necessary when a pig gets sick, injured, or otherwise in poor condition. The initial decision for action may include treatment or euthanasia. In some cases, euthanasia may be the best option for the pig's well-being (NPB, 2016). According to Morrow et al. (2006), veterinary decisions for the euthanasia of companion animals follow both subjective and objective guidelines. For example, some subjective measures may involve the ability of the animal to enjoy food, breathe freely and without difficulty, eat and drink without pain, and respond to the owner and family (Morrow et al., 2006). In contrast, objective guidelines evaluate weight loss, weakness, infection, organ failure, and injuries (Duncan, 1988). Some key elements for determining if a method of euthanasia is humane include minimal pain and distress to the pig, rapid loss of consciousness, and death achieved quickly and consistently (NPB, 2016). Animal welfare requires disease prevention and veterinary treatment, appropriate shelter, management, nutrition, humane handling, and humane euthanasia (American Veterinary Medical Association (AVMA); 2022).

Even with established guidelines in the CSIA, euthanasia decision-making varies among farms. The National Pork Board gives practical recommendations on swine euthanasia in the On-Farm Euthanasia of Swine: Recommendations for the Producer document (NPB, 2016). However, it only describes the approved methods to conduct euthanasia in swine and not recommendations on what to look for to determine if an animal should be euthanized or not. The Common Swine Industry Audit (CSIA; 2018) requires that animals with certain conditions be euthanized, and it can be used as a guideline about what pigs should be euthanized to meet the audit standards. These conditions include pigs that have been treated for two consecutive days and fail to show improvement and pigs with hernias that are perforated or large enough to drag on the floor with ulcerations, causing the pig trouble walking. In addition, immediate euthanasia is required for uterine prolapses, rectal prolapses with signs of necrosis, pigs that are severely injured or non-ambulatory with an inability to recover, and non-ambulatory pigs with a body condition score of one. Additionally, using the five freedoms in day-to-day production systems can be practical, established in context for use by the producers, and linked to the financial aspects of production (Morrow et al., 2006).

Hospital pens are designed to house ill animals, and should be treated and nursed back to health. However, most hospital pens function as sick pens where animals are not

commonly treated (Blackwell, 2005). Properly operated hospital pens (those that offer extra warmth, good footing, easy access to feed and water, and have established protocols for treatment, culling, and euthanasia) provide an economic return, improve worker morale, and improve the welfare of compromised pigs (Blackwell, 2005). When a pig dies in a hospital pen, it should always be a surprise. If workers say to themselves that they are happy because a particular pig finally died, euthanasia decision rules are inadequate, and the caretakers have neglected part of their responsibilities (Blackwell, 2005).

Performing euthanasia is a multi-step process requiring observational abilities to identify compromised pigs and the technical skills and willingness to humanely terminate these animals (Mullins et al., 2017). Timely euthanasia in pigs is critical to meeting good production practices and animal welfare. The reasons for not performing timely euthanasia or not performing it at all may vary. Hartnack et al. (2016) reported that veterinarians who had worked for fewer years or were newer to the profession were more likely to disagree with euthanasia in some scenarios. Therefore, moral stress due to performing euthanasia needs to be better understood. Moral Stress is caused by decisions regarding ethical conflicts that do not coincide with one's values. (Jurney & Kipperman, 2022). Many veterinarians do not think veterinary schools trained and prepared them to relate to clients of terminally ill animals and euthanasia, which results in significant stress to veterinarians who, on average, euthanize 7.53 animals per month (Dickinson et al., 2011).

The term 'compassion fatigue' was first described by Joinson (1992) as the distress experienced by those in human nursing positions, but has been used to describe the emotional effects of euthanizing animals (Scotney et al., 2015). A study about compassion fatigue in animal care employees recommends evaluating potential moral stressors in animal care workers. At the same time, moral injury has yet to be studied in the animal care community (Andrukonis et al., 2018). It has been suggested that caretakers may experience a wide range of negative emotions, including grief or distress when performing euthanasia (Benjamin et al., 2015). As such, the "caring-killing paradox" (Arluke, 1994) first explored animal shelter workers tasked with euthanizing the same companion animals for which they were providing care for. Both compassion fatigue and the caring-killing paradox have been suggested as factors affecting euthanasia decisions on swine farms (Mullins et al., 2017).

In the 2021 year, the pork industry supports nearly 550,000 jobs (NPB, 2021). Swine industry employees can significantly affect animal welfare due to the delay in euthanasia. Matthis et al. (2005) conducted a survey in which they determined that ethnic background and gender affect employee attitudes toward euthanasia. Spanish-speaking female employees and employees with certain personality traits had more negative attitudes toward euthanasia. However, all employees prefer a method of euthanasia that is perceived as less painful to a pig, suggesting that the animal's welfare is of paramount importance to caretakers. Matthis et al. (2005) also found that the longer an employee has been in the role of euthanizing pigs, the higher the willingness is to euthanize. A study by McGee et al. (2016) revealed that many swine caretakers agree that it is crucial to have good skills for euthanasia, that they know how to euthanize humanely, and that it is humane to euthanize ill pigs. Caretakers also preferred to be trained on-farm and agreed that proper euthanasia techniques are important; males and females did not differ in their perspectives concerning euthanasia technology and training (McGee et al., 2016). Relating this to our study, caretakers in the swine industry may be affected by feelings of not being able to identify or misidentifying compromised animals, and performing timely or efficient euthanasia.

In 2014, Latinos/Hispanics accounted for 16.1% of the 146.3 million employed people in the United States [U.S.] (Bureau of Labor Statistics, 2015). Among occupational groups in 2014, 43.4% of workers in farming, fishing, and forestry were Latino/Hispanic (Bureau of Labor Statistics, 2015). Given that over 500,000 agricultural workers are identified as first-generation immigrants of Latino/Hispanic background (Pork Information Gateway, 2014), these high Hispanic employment rates indicate that it is critical to explore cultural differences in caregivers' attitudes, values, and beliefs about performing euthanasia. Determining if caregivers can be psychologically impacted by performing euthanasia based on cultural differences can be an important indicator of how to efficiently train the Hispanic workforce. For instance, experiences of anxiety, depression, work-related Stress, and help-seeking behaviors vary across cultures and other demographic variables (Griner & Smith, 2006).

The North American Free Trade [NAFTA] was established on January 1, 1994 (Lahoud, 2021). According to the U.S. Citizen and Immigration Services, this agreement created unique economic and trade relationships for the United States, Canada, and Mexico. The TN non-immigrant classification permits qualified Canadian and Mexican citizens to pursue temporary entry into the United States to engage in business activities at a professional level. To apply for this agreement, the participant's profession must meet the regulations, and the applicant must have the qualifications and knowledge required for employment (U.S Citizen and Immigration Services, 2021).

A recent study by swine industry experts (Mullins et al., 2017) indicated that managers believed that logistical, economic, emotional, and cultural barriers contributed to a delay in timely euthanasia decisions for their staff. Missing from Mullins et al. (2017) investigation were interviews with actual caretakers, which the researchers acknowledged had left questions unanswered regarding caregivers' direct experiences and beliefs about barriers to performing timely euthanasia. Interviewees voiced the belief that, as a group, competent caretakers are vested in sustaining the pigs' lives, and this aspect of their occupational role may be at odds with performing euthanasia. Furthermore, managers lacking cross-cultural communication skills may also contribute to employee dissatisfaction and Stress (Garcia-Pabon, 2014).

**Objectives:** The overall objective of this study is to identify the financial, educational, psychological, cultural and other barriers that lead to a delay in performing timely euthanasia. This objective will be accomplished by:

1. Developing and validating surveys of caretakers'/workers' attitudes towards euthanasia.
2. Using the developed survey materials to assess caretakers/workers in the:
  - i. Farrowing barn
  - ii. Nursery-grow-finishing barn
  - iii. Breeding barn
3. Utilize focus groups to better understand the underlying psychological impact on caretakers when performing on farm euthanasia that may not have been identified by the surveys.
4. To establish a framework on which future intervention strategies based on our findings can be used to improve animal welfare, caretaker morale/mental health, and job satisfaction.

**Materials & Methods:** Before the data collection, the research group reviewed the instrument to familiarize themselves with it. The instrument revision was conducted to accomplish consistency between researchers when delivering the surveys, note-taking, and other procedures used during the surveying. Afterward, the instrument was printed to deliver to the corresponding farms. At the farm, the researchers followed all biosecurity protocols and set up the lunch area to accommodate the participants and provided lunch to participants. Food was provided during the research to encourage an adequate and open working environment and to allow them to answer the surveys while they had lunch.

Data was collected from swine 16 farms in the State of Iowa. Group sizes varied, depending on the farm's size, with a range of seven to 18 caretakers per farm. As more than 90% of the workers were Spanish-speaking, the surveys were only given in Spanish and English-speaking did not participate in the study. The farms were asked to remove recording equipment to keep the data collection confidential. Prior to starting the survey, participants were informed about the study's purpose and confidentiality. Participation was entirely voluntary, and all Spanish-speaking caretakers were invited to participate. Those that opted not to take part were still invited to eat lunch. Participants marked their instrument by an ID number assigned by the place they were seated to ensure anonymity but to continue responding to the same survey the next day.

Researchers started the activity by introducing themselves. The instrument was administered over two days, and each day, a period of 60 minutes was used for data collection. Demographic questions, Swine Management, and The Impact of the Event were covered on the first day, while The professional Quality of life and The Moral Injury Event Scales were carried on the second day.

Researchers read each question aloud in Spanish, ensuring that every participant understood what was asked. Participants were given one minute to answer each question and extra time for any clarification. At the end of the first day, surveys were collected and kept secure inside the farm due to the biosecurity protocols.

Participants were asked to take the same seats starting the second day to get their survey. Again, the protocol was the same as the first day. At the end of the second day, all the surveys were collected and kept in an envelope labeled per farm.

### **1) Development and Validation of an Instrument to Identify Swine Caretakers' Attitudes Toward Pig Euthanasia**

An 83-item instrument was developed and validated to identify Spanish-speaker swine caretakers' attitudes toward pig euthanasia. It consisted of five survey sections: 1) Demographics, 2) Swine Management, 3) The Impact of Event Scale-Revised (Bride et al., 2007), 4) The Professional Quality of Life Scale (ProQOL, 2009), and 5) The Moral Injury Event Scale (Nash et al., 2014). The survey sections were used to identify the barriers associated with performing pig euthanasia.

#### General demographics

The first section was about demographic information. It incorporated nine demographic questions gender, age, country of origin, income, education level, education major, time working in the swine industry, time working on the farm, and farm work unit) were used to understand the sample background.

#### Swine Management Survey

The second section included swine management questions, where a group of researchers developed a 19-item dichotomous (yes/no) questionnaire. The specific intention of this section was to assess swine caretakers' attitudes, behaviors, experiences, feelings, and knowledge toward pig euthanasia.



### The Impact of Event Scale-Revised (Bride et al., 2007)

The third survey section survey was composed of intrusion and avoidance constructs. The scale ranged from 1 (never) to 6 (very often). Originally, it was designed to measure directly experienced trauma and, used to evaluate the psychometric properties in veterans (Creamer et al., 2003). A previous study by Bride et al. (2007) using the Impact of Event Scale to measure compassion fatigue provided a summary and review of the most commonly utilized instruments for measuring different aspects of compassion fatigue. In the mentioned study each instrument reviewed has varying levels of evidence regarding its psychometric properties, and each was useful for specific purposes showing a good internal consistency ( $\alpha = .80$ ) (Bride et al., 2007). Intrusion assesses unwanted thoughts, images, dreams, waves of feelings, and repetitive behavior related to the stressor. While, avoidance evaluates numb sensation, behavioral inhibition, and awareness of emotional indifference (Bride et al., 2007). A version working with burn victims found a good internal consistency ( $\alpha = .87$ ) for the total scale, showing to be reliable and valid to assess post-burn reactions on the impact of the event in the group of patients under analysis (Echevarria-Guanilo et al., 2011).

### The Professional Quality of Life Scale (ProQOL, 2009).

The fourth survey section. This section consisted of 30 questions to rate how frequently participants experienced a particular situation. It consisted of three constructs: Compassion Satisfaction, Burnout, and Secondary Traumatic Stress, each composed of 10 questions. The response options ranged from 1 (never) to 5 (very often). To assess compassion Satisfaction, caretakers were asked about the job Satisfaction they felt from being able to perform their work efficiently. On the contrary, Burnout was related to questions about feelings of hopelessness and difficulty managing or performing their work correctly. It can also manifest feelings of a non-supportive work environment or large workload. Finally, Secondary Traumatic Stress was a secondary exposure to significantly or traumatically stressful circumstances connected to their work.

The Professional Quality of Life Scale showed a Burnout construct with an acceptable inter-item consistency ( $\alpha = .75$ ). Certain items were designed negatively and required reverse coding for the analysis. While the Compassion Satisfaction constructed also presented an acceptable inter-item consistency ( $\alpha = .88$ ). Finally, the Secondary Traumatic Stress construct showed an acceptable inter-item consistency ( $\alpha = .81$ ); all of these constructs showed to be reliable and valid for this scale use (ProQOL, 2009).

### The Moral Injury Event Scale (Nash et al., 2014)

The fifth survey section included Transgressions and Betrayal constructs. The response options ranged from 1 (strongly agree) to 6 (strongly disagree). This instrument has been used previously in a military context (Nash et al., 2013). Transgression was identified as an act against their ethics or beliefs and Betrayal as a violation of a person's trust or confidence. This scale has shown good internal inter-item consistency ( $\alpha = .86$ ) for the full eleven-item scale and an excellent ( $\alpha = .90$ ) inter-item internal consistency for the shortened nine-item scale, showing to be reliable and valid to assess the moral injury with both, full eleven-item, and shortened nine-item scales (Nash et al., 2013).

The nine-item shortened scale by Nash et al., (2013) was used in this item five ("I violated my morals by failing to do something I felt I should have done") was removed from the analysis. To adapt the scale and guarantee that the three constructs were not affected by the modification, a confirmatory factor analysis [CFA] was conducted. The CFA showed that the deletion did not affect the model fit indices, CFI = .90, Chi-square = 628.98, df = 28,  $p < .001$ . SRMR = 0.061. Additionally, the inter-item consistency was measured for the two constructs, showing an acceptable inter-item consistency ( $\alpha = .73$ ) for the Betrayals' construct and a good

inter-item consistency for the Transgression construct ( $\alpha = .86$ ), showing to be reliable and valid to assess Betrayal and Transgressions perceived by swine caretakers using the Moral Injury Event Scale (Rubin & Babbie, 2009).

The Impact of Event Scale-Revised (Bride et al., 2007), The Professional Quality of Life (ProQOL, 2009), and The Moral Injury Event (Nash et al., 2014) scales were adapted from other fields to the swine industry to determine the psychological impact of the on-farm euthanasia process on caretakers. Then, since the target population consists of Spanish speakers, the complete instrument was translated into Spanish. A panel of Spanish-speaking researchers with swine industry backgrounds and survey development experience validated the translation. To assess content validity also the instrument was applied to the Hispanic researchers of the study, to verify it accomplished the objectives and was understandable to the participant audience.

Panel members were asked to provide general feedback, as well as specific feedback on (a) each item's correspondence with research aims and questions, (b) the phrasing of items, (c) the sequencing of items, and (d) the survey length and readability.

### Data Cleansing

The data collected was transferred to Excel® and coded. The hard copies were kept secure for further analysis. In total, 175 participants completed the survey. Incomplete responses (less than 50% of the survey), and participants without euthanasia responsibility, were not considered. This resulted in less than 5% of responses. Surveys with less than 10% missing data were imputed using multiple imputation procedures (Enders, 2017). Then, 12 outliers and extreme values were removed using Cook's distance (Fox, 2015). After data cleansing, the final amount of valid responses was 163 (93.14%).

### Data Analysis

Data were analyzed using Statistical Package for Social Sciences (SPSS) v.27 and Statistical Analysis System (SAS) v.9.4. An alpha level of 0.05 was established as a priori for all inferential analyses.

The demographic variables were categorized as age (18-35, 36-45, 46-more), Income per year (19,000-24,000, 24,001-29,000, 29,001-34,000, 34,001-39,000, 39,001-more), education level (university and non-university), time working the swine industry and in the farm (0-12 months, 13-48 months and more than 49 months), Farm work unit (farrowing, breeding and caretakers that were included in both areas) to better understand the groups and population.

Descriptive statistics such as means, mode, range, standard deviations, and coefficient of variation were used to characterize participants' demographic information. Chi-Square analysis was run to determine caretakers' characteristics that influenced performing euthanasia.

Non-parametric tests were used, as the data were not normally distributed. A preliminary analysis showed that The Impact of Event Scale's results did not present any variability ( $M = 1$ ,  $SD = 0$ ). Therefore, it was not used for further inferential analyses.

Mann-Whitney U and Kruskal-Wallis tests were used to determine the median differences between groups of demographic variables in the psychological constructs. The demographic variables included gender, age, country of origin, income, education level, major, time working

in the swine industry, time working on the farm, and work unit. The constructs analyzed included: Satisfaction, Burnout, Stress, Transgressions, and Betrayal.

Performing on-farm pig euthanasia was considered a traumatic event for the swine industry caretakers. That was the reason for using psychological constructs and demographic characteristics that helped to understand the Spanish-speaking behaviors toward this process. The psychological constructs and demographic variables were analyzed using median group comparison between groups, to identify barriers that delay the euthanasia process that can vary in a variable category.

Spearman's rank-order correlations and linear-by-linear regression analysis were used to determine the relationships among all the corresponding constructs and the psychological effects of performing on-farm pig euthanasia. In addition, simple linear regressions were conducted among psychological constructs to predict the constructs' level among themselves.

Then, correlations and regressions were made between constructs to understand how a variable relates to another. These analyses helped to find the variation of strength and direction relation, as well as the prediction of a construct based on another one. These analyses are important since they can be a technique to shorten the instrument size to measure these scales. While thinking of future studies, this may help improve data results by limiting the number of items in the survey, which could affect reducing fatigue, error, and bias in the participants' answers.

Results of assumptions analyses showed independence of residuals. Data were homoscedastic, as assessed by visual inspection of a plot of studentized residuals versus unstandardized predicted values. There was no evidence of multicollinearity, as evaluated by tolerance values greater than 0.1. There were no studentized deleted residuals greater than  $\pm 3$  standard deviations; no leverage values greater than 0.2, and values for Cook's distance above 1. The assumption of normality was also met, as assessed by Q-Q Plot.

To complement the quantitative information, a case study qualitative research was implemented based on the survey responses (Creswell & Creswell, 2018). In total, 85 individuals were grouped in 11 focus groups based on the farm they worked on (Aurini et al., 2016). Qualitative researchers suggest having a philosophical paradigm that frames the study to have a better guide (Creswell & Creswell, 2018). The social constructivist lens was selected as the philosophical paradigm for this study since it looks to infer an event in specific groups' lives and assign meaning to their personal, subjective views (Creswell & Creswell, 2018).

Several data sources were used, including semi-structured focus group interviews, observations, research memos, and document analysis. Eleven questions were implemented in the focus groups, which allowed the researchers to follow a line-up questioning but left space to inquire about the opinions of the contestants regarding essential topics that may take place during the interview (Creswell & Creswell, 2018). The eleven focus group interviews lasted approximately 45 to 60 minutes. The discussions were audio-recorded after participants' authorization and transcribed with Sonix AI platform, and reviewed by the researchers to guarantee the accuracy of the data.

Researchers used "memoing" after each interview and during important moments (Saldaña, 2016). The memoing was used to preserve important information that could not be audio

recorded. This method includes writing down inquiries, comments, personal feelings, and interview reflections. This allowed the enhancement of the transparency of the researchers' bias through reflexivity (Lincoln & Guba, 1985). In addition, the information from the memoing and interviews matched with the other gathered data as documents and observations. This guarantees the triangulation of all the sources of information.

The non-participant observations were applied, ensuring the member could develop in their natural environment (Creswell & Creswell, 2018). Researchers watched and listened to the teams' interactions and took copious field notes while recording my thoughts during the intervention. The members were notified that they would be observed, explained the purpose of the observation, and let them ask if they had any questions. We followed the three phases of observation. we displayed a descriptive observation to provide an unspecific description, narrowed the problems, and selected observations to describe specific themes that emerged during the interviews (Flick, 2018; Spradley, 2011).

All interviews were audio-recorded. Each interview was reviewed to guarantee its accurate transcription preserving the colloquial expressions. After transcribing the interviews, researchers analyzed the data with a constant comparative method. As soon as the researchers conducted the interview, they transcribed and coded it (Creswell & Creswell, 2018). According to Morse and Richards (2002), the objective of coding is to let the researcher focus and simplify the interpretation of the data.

The first series of coding implemented was an initial open coding. According to Saldaña (2016), this coding is helpful for case studies because it opens to correct and redirects the focus of the data analysis. During the coding process, researchers clarified questions, making sure to be in the correct direction. The coding objective was to take apart data, reconfigure it through the identification, and establish them in categories of each phenomenon that appears, generating categories, subcategories, and dimensions (Saldaña, 2016).

After the first coding cycle, pattern coding was used as an explanatory coding that pulls the raw material into a more meaningful unit of analysis. The data analysis methodology helped researchers tie data with the source of data as topics, concepts, and themes and gave an order to the data by transforming it into malleable (Morse & Richards, 2002). We used pattern coding because it allows looking for rules and causes an explanation of the data. We grouped codes into major themes to better understand the phenomena (Saldaña, 2016).

According to Creswell and Creswell (2018), it is recommended to ensure credibility, transferability, dependability, and confirmability as the main aspects of research rigor in a qualitative study. Ary et al. (2010) define credibility as the responsibility of the researcher to represent information established in the research as precisely as possible. There are different ways to guarantee research credibility, such as demonstrating group engagement (Cope, 2014). All the researchers were of Hispanic origin, and during the survey implementation, the researcher shared with them and made them understand that we were not there just for research purposes. It was because we are Hispanics trying to help Hispanics conducted previous research with them in which we talked about working for three weeks on this study by training them about personal and team leadership.

Transferability corresponds to validity in quantitative research (Cope, 2014). Although every research is unique (Saldaña, 2016), We guaranteed transferability by comprehensively describing the participants and accurately explaining the methodology. According to Guba and Lincoln (1985), dependability is compared with reliability for qualitative research. However, a way to guarantee dependability is by reporting the interviews and explaining how the research was conducted. For this study, the data stored included interview transcriptions, field notes, and reflexive memos.

According to Ary et al. (2010), research reflexivity can establish confirmability. Reflexibility happens when we transmit our background to eradicate bias (Creswell & Creswell, 2018). To guarantee confirmability, we frequently review their interviews, ruminating on the biases and assumptions that could appear. After the data analysis, three themes emerged from the data, (1) reasons for swine caretakers' stress, (2) the importance of work experience to perform euthanasia, and (3) potential training to improve caretakers' mental health.

## **Results:**

### **1) Development and Validation an Instrument to Identify Swine Caretakers' Attitudes Toward On-Farm Pig Euthanasia.**

The developed instrument was composed of 83 items grouped into five survey sections: Demographic Information, Swine Management, The impact Of Event Scale-Revised, The Professional Quality of Life Scale, and The Moral Injury Event Scale.

The Impact of Event Scale-Revised: Unfortunately, the results from this scale did not present any variability ( $M = 1$ ,  $SD = 0$ ). Therefore, it was not used for further inferential analyses.

The Professional Quality of Life Scale: For this study, the Satisfaction construct consisted of 10 items and an acceptable inter-item consistency ( $\alpha = .77$ ). The Burnout construct consisted of 10 items which were analyzed by reverse coding and presented an acceptable inter-item consistency ( $\alpha = .70$ ). Finally, the Secondary Traumatic Stress construct consisted of 10 items. The inter-item consistency was acceptable ( $\alpha = .71$ ), showing to be reliable and valid to assess Satisfaction, Burnout, and Secondary Traumatic Stress in swine caretakers using the Professional Quality of life Scale (Rubin & Babbie, 2009).

The Moral Injury Event Scale: Based on the previously mentioned item selection variability, researchers adapted it by removing item five ("I violated my morals by failing to do something I felt I should have done"). To guarantee that the three constructs were not affected by the modification, a confirmatory factor analysis [CFA] was conducted. The CFA showed that the deletion did not affect the model fit indices,  $CFI = .90$ ,  $\text{Chi-square} = 628.98$ ,  $df = 28$ ,  $p < .001$ .  $SRMR = 0.061$ . Additionally, the inter-item consistency was measured for the two constructs, showing an acceptable inter-item consistency ( $\alpha = .73$ ) for the Betrayals' construct and a good inter-item consistency for the Transgression construct ( $\alpha = .86$ ), showing to be reliable and valid to assess Betrayal and Transgressions perceived by swine caretakers using the Moral Injury Event Scale (Rubin & Babbie, 2009).

### **2) Use the developed survey materials to assess caretakers/workers in the:**

- ✓ Farrowing barn
- ✓ Nursery-grow-finishing barn
- ✓ Breeding barn

Demographic Survey Frequencies: Regarding participants' demographic characteristics, the majority were male (n = 107; 65.6%) and young adults between 18 and 35 years old (n = 116; 71.2%). Just 6.7% of the participants were over 46 years old. Most of the participants were Mexicans (n = 156; 96.9%). Income was divided into six categories, starting at 19,000 USD, each with a 5,000 USD range. Over a quarter of the participants (n = 43; 26.4%) earned between 29,000 and 34,000 USD. Within their education level, a high proportion of participants had a university degree (n = 137; 84.0%), with more than half majoring in veterinary medicine or animal husbandry (n = 94; 57.7 %). Regarding caretakers' work experience, around 50% had worked in the swine industry and had worked at the farm between 13 and 48 months. Lastly, 62% of caretakers worked in a farrowing farm unit (n = 101), 25.2% in a breeding unit (n = 41), and 11% of the participants worked in both units simultaneously (n = 18). Figures 1-7 and Table 1 show the participants' demographic information.

According to the demographics survey results, even though euthanasia was a responsibility of all participants in this analysis (100%), almost half 42.3% (n = 69) of the participants did not like to euthanize pigs. All participants dealt with sick or injured pigs and could differentiate a healthy pig from a compromised pig (100%). Although 95.7% (n = 156) of caretakers were formally trained to recognize compromised pigs, some caretakers (2.5%; n = 4) did not have time in their shift to identify sick or injured pigs.

A few caretakers (5.5%; n = 9) stated they wait for another person to recognize the sick/injured pigs and did not do it themselves. A total of 95.7% (n = 156) of participants believed that the hospital pen benefits compromised pigs, but only 82.8% (n = 135) of caretakers regularly check these facilities, and 90.8% (n = 148) of respondents record when moving a pig into a hospital pen. Less than half, 44.2% (n = 72) of participants were aware/knew of the CSIA.

Some caretakers, 79.1% (n = 129), consider telling others when to euthanize a pig as part of their job. Most caretakers 98.2%, (n = 160) know when to perform euthanasia immediately according to the farm action plan, and most participants 94.5%, (n = 154) identify and euthanize a pig immediately according to the farm criteria; however, only 71.8%, (n = 117) of caretakers decide when an animal needs to be euthanized and perform euthanasia themselves. Moreover, 19.5% (n = 32) of caretakers consider it easier if someone else identifies the sick/injured pigs for them and then they themselves perform euthanasia. On the other hand, 33.7% (n = 55) prefer to identify the compromised pigs and someone else to perform euthanasia. Table 2 describes the Swine Management section frequencies.

Caretakers' Characteristics that Influence Euthanasia by Demographics and Swine Management Survey: A Chi-Square analysis was run to determine swine caretakers' characteristics influencing their ability to perform euthanasia. A total of 22 Chi-Square analyses were performed, reporting significant differences for each demographic variable item compared with the swine management section survey items. Specific characteristics among the caretakers seem to influence practices related to the euthanasia process in the swine industry, such as education level, time working in the swine industry, time working on the farm, income range, and work unit. Surprisingly, gender and age showed no statistical differences in swine management practices. Table 2 describes frequencies results for the Swine Management Survey.

Common Swine Industry Audit Knowledge by Swine Industry and Farm Experience, and Farm Work Unit

A Chi-Square test of independence was calculated by comparing the Swine Management Section (yes = 1, no = 2) and Demographic Section. The relation between these variables

showed a significant difference between Common Swine Industry Audit knowledge and the time working in the swine industry ( $X^2 = 2$ ,  $N = 163$ ,  $p < .001$ ). Participants with more than a year of experience in the swine industry, are more likely to know about the CSIA, whereas 82.05% ( $n = 32$ ) of caretakers with less than a year of experience do not have knowledge of the CSIA. However, over a quarter of the most experienced (more than 49 months) caretakers are not aware of this audit, 28.26% ( $n = 13$ ).

Results also showed a significant difference between Common Swine Industry Audit knowledge and the time working at the farm ( $X^2 = 2$ ,  $N = 163$ ,  $p < .001$ ). A high number of participants 77.27%, ( $n = 34$ ) of caretakers with 0-12 months of experience on the farm did not have knowledge of the CSIA; further, just 27.27%, ( $n = 9$ ) of most experienced caretakers lack this knowledge ( $p < .001$ ).

Lastly, participants' responses showed a significant difference between Common Swine Industry Audit knowledge and the farm work unit, ( $X^2 = 2$ ,  $N = 160$ ,  $p = .005$ ). More than half 53% ( $n = 54$ ) of the farrowing caretakers did not have knowledge of the CSIA. In comparison, 26.83% ( $n = 11$ ) of the breeding area and 27.78%, ( $n = 5$ ) of caretakers working in both areas do not know about the CSIA at all.

Easier if Someone else identifies the compromised pigs for them to perform euthanasia by Education Level and Farm Work Experience.

The results indicated that there was a significant difference in the relationship between caretakers that found it easier if someone else identifies the compromised pigs for them and then the caretakers themselves perform the euthanasia and education level. ( $X^2 = 1$ ,  $N = 156$ ,  $p = .010$ ). Most caretakers with a university degree do not consider it easier if someone else identifies the sick/injured pigs for them, so they can perform euthanasia 83.21%, ( $n = 114$ ). In comparison, 42.11% ( $n = 11$ ) of those without university education consider it easier if someone else identifies the compromised pigs and they themselves perform euthanasia themselves.

The results for time working at the farm showed a difference between groups, ( $X^2 = 2$ ,  $N = 163$ ,  $p < .001$ ). A total of 31.82% ( $n = 14$ ) of the less experienced caretakers (0-12 months at the farm) would prefer if someone else identified the compromised pigs for them and then the caretakers themselves perform euthanasia. While just 18% of the caretakers with more than a year working at the farm think will be easier if someone else identifies the compromised pigs and then, the less experienced workers perform the euthanasia by their own.

Capacity to identify compromised pigs and perform euthanasia on their own by Time Working in Industry and at the Farm

As in other criteria, the decision-making varies, and confidence increases with experience in the swine industry, ( $X^2 = 2$ ,  $N = 163$ ,  $p < .001$ ). Another noteworthy finding indicated that 59.85% ( $n = 21$ ) of the caretakers with less than a year in the industry do not feel capable of identifying and performing the euthanasia process themselves, while 21.74% ( $n = 10$ ) of most experienced caretakers do not feel capable of identifying and euthanizing compromised pigs themselves.

Similarly, results between the time working at the farm vary ( $X^2 = 2$ ,  $N = 163$ ,  $p < .001$ ). A total of 52.27% ( $n = 23$ ) of the less experienced caretakers (0-12 months) at the farm do not identify and perform euthanasia themselves, while 18.60% of caretakers with 13-49 months of experience do not feel this capacity to perform euthanasia. Lastly, 21.21% ( $n = 7$ ) of caretakers with more than 49 months of experience at the farm do not feel capable of identifying and performing euthanasia themselves.

The results in general indicate that caretakers with less than a year working at the farm were not aware of the CSIA. Participants with more than a year of experience showed a higher

capacity to identify compromised pigs and conduct euthanasia themselves. In addition, caretakers with less than a year of experience stated that it would be easier if someone else identified the sick or injured pigs and then performed the euthanasia by their own.

The results for participants with a non-university education level indicated that it would be easier for them if someone else identified the compromised pigs and then, they can perform the euthanasia by their own. Caretakers with less than a year in the swine industry presented a lack of CSIA knowledge, and a lower capacity to identify when a pig needs to be euthanized and perform euthanasia themselves. Lastly, caretakers in the farrowing unit do not regularly check the hospital pens and are not aware of the CSIA.

To Determine Demographic and Psychological Barriers Associated With Timely Pig Euthanasia Performance.

The Professional Quality of Life Scale Frequencies

Barriers that delay timely euthanasia were measured as an overall criterion that included all the survey constructs. The Professional Quality of Life Scale measured Satisfaction, Burnout, and Stress constructs (1 = never, five = very often).

Participants' responses showed high satisfaction ( $M = 4.11$ ,  $SD = 0.49$ ), where participants got a higher satisfaction from being able to help animals ( $M = 4.65$ ,  $SD = 0.63$ ) and they like their jobs ( $M = 4.39$ ,  $SD = 0.88$ ). They also indicated that they feel satisfied with how they handle the techniques and protocols of their work ( $M = 4.21$ ,  $SD = 0.87$ ). Caretakers responded that their work makes them feel satisfied ( $M = 4.21$ ,  $SD = 0.80$ ) and they often have happy thoughts and feelings about those animals they helped and those they can help ( $M = 4.02$ ,  $SD = 0.87$ ). Participants also presented high satisfaction because they believe they can make a difference through their work ( $M = 4.10$ ,  $SD = 0.83$ ) and feel proud of what they can do by helping the animals ( $M = 4.26$ ,  $SD = 0.82$ ). Lastly, caretakers are happy that they chose their job ( $M = 4.31$ ,  $SD = 0.86$ ). However, caretakers found lower satisfaction due to not always feeling with energy after working with animals ( $M = 3.27$ ,  $SD = 0.98$ ) and are not sure if they are successful in their work ( $M = 3.67$ ,  $SD = 1.00$ ).

On the other hand, participants rarely presented burnout in their responses ( $M = 2.04$ ,  $SD = 0.52$ ). Even though sometimes, caretakers may feel tired because of their work ( $M = 2.91$ ,  $SD = 1.01$ ) and sometimes feel connected to animals ( $M = 3.33$ ,  $SD = 1.08$ ). Occasionally they feel burnout because their workload seems endless ( $M = 2.57$ ,  $SD = 1.11$ ). However, they consider themselves as people who very often care about animals ( $M = 4.57$ ,  $SD = 0.64$ ), and caretakers often consider they are happy ( $M = 4.28$ ,  $SD = 0.72$ ), they also commonly think they are the person they always wanted to be ( $M = 4.07$ ,  $SD = 0.94$ ). Caretakers never feel they are not as productive at work because of losing sleep over the traumatic experiences of the animals they help ( $M = 1.25$ ,  $SD = 0.68$ ). Lastly, they do not feel trapped by their job ( $M = 1.85$ ,  $SD = 1.11$ ) and rarely feel "blogged down" by the system ( $M = 2.08$ ,  $SD = 1.11$ ).

Finally, participants stated that they were not highly stressed ( $M = 1.64$ ,  $SD = 0.51$ ). Caretakers rarely do not remember traumatic parts of their work with animals ( $M = 2.01$ ,  $SD = 1.33$ ), rarely find it difficult to separate their personal lives from work-life ( $M = 1.98$ ,  $SD = 1.05$ ), and rarely have felt "on edge" about various things ( $M = 1.95$ ,  $SD = 1.95$ ). Moreover, they never have intrusive, frightening thoughts due to helping animals ( $M = 1.22$ ,  $SD = 0.703$ ), never jump or are startled by unexpected sounds ( $M = 1.13$ ,  $SD = 1.03$ ), nor do they think that they might have been affected by the traumatic stress of those animals they help ( $M = 1.27$ ,  $SD = 0.67$ ). Caretakers never feel depressed because of the traumatic experiences of the animals they help ( $M = 1.33$ ,  $SD = 0.67$ ). They do not feel as though they are experiencing the trauma of the animals they help ( $M = 1.42$ ,  $SD = 0.80$ ) nor do they avoid certain activities or situations because they are reminded of frightening experiences with the



animals they help (M = 1.43, SD = 1.88). Table 3 describes the professional quality of life results.

#### The Moral Injury Event Scale Frequencies

Barriers that delay on-time euthanasia were measured as an overall criterion that included all the survey constructs. The Moral Injury Event Scale measured Transgressions and Betrayal constructs (1= strongly agree, 6 = strongly disagree).

Participants' responses measured perceived transgressions (M = 4.43, SD = 1.34) and perceived betrayals (M = 4.42, SD = 1.36) by themselves and others. Participants did not feel they acted in ways that violated their moral code or values (M = 4.89, SD = 1.50), nor did they see things that were morally wrong (M = 4.36, SD = 1.58). They also did not feel they had acted in ways that violated their morals or values (M = 4.37, SD = 1.79). Caretakers presented higher perceived transgressions and were troubled by witnessing others' immoral acts (M = 4.23, SD = 1.69). Moreover, participants feel more betrayed by leaders they once trusted (M = 4.31 SD = 1.85) and less betrayed by other people outside of the job as can be family or others in their personal life (M = 4.58, SD = 1.62) also, caretakers were disagree by feeling betrayed by coworkers they once trusted (M = 4.37, SD = 1.57). Table 4 shows the frequencies of The Moral Injury Event Scale responses.

#### Mann-Whitney U Test to Evaluate Differences Between Demographics of Two Categories and The Professional Quality of Life Scale

A Mann-Whitney U Test was used to compare differences between demographic questions, which only included two categories: gender and education level groups in relation to The Professional Quality of Life Scale constructs. Results for gender presented significant differences related to Satisfaction and Stress.

Satisfaction scores for males (Mdn = 4.20, SD = 0.51) were higher than for females (Mdn = 4.00, SD = 0.43),  $U = 2120$ ,  $z = -2.44$ ,  $p = .015$ . On the other hand, Stress scores for males (Mdn = 1.44) were lower than for females (Mdn = 1.67),  $U = 2178$ ,  $z = -2.23$ ,  $p = .026$ .

Finally, Satisfaction scores for workers with university education level (Mdn = 4.10, SD = 0.48) were higher than for non-university education levels (Mdn = 3.80, SD = 0.54),  $p = 0.052$ . Table 5 shows the frequencies and differences of medians for gender and university level in The Professional Quality of Life Scale constructs.

#### Mann-Whitney U Test to Evaluate Differences Between Demographics and The Moral Injury Event Scale

Mann-Whitney U Test was used to compare differences between demographic questions, which only included two categories: gender and education level groups in relation to The Moral Injury Event Scale constructs. Results for gender and education level groups did not present significant differences in medians related to Betrayal and Transgressions constructs did not show significant difference of medians ( $p > 0.05$ ). Table 6 shows the frequencies and differences of medians for gender and university level in The Moral Injury Event Scale constructs.

#### Kruskal-Wallis Test Evaluates Differences Between Demographics With More Than Two Categories, The Professional Quality of Life And The Moral Injury Event Scale.

A total of 5 Independent Kruskal-Wallis tests were run to determine differences between groups in variables with more than two categories (age, income, education level, major, time working in the swine industry, time working at the farm, and farm work area). Results showed no statistically difference ( $p > 0.05$ ) in the mentioned demographic variables between the different psychological constructs of The Professional Quality of Life and The Moral Injury Event Scale.

A Spearman's Correlations Analysis to Identify How the Psychological Constructs are Related to Each Other.

A Spearman's correlations analysis was run between The Professional Quality Of Life and The Moral Injury Event Scale Constructs. A significant correlation was found between most variables except for betrayals and satisfaction. The highest positive relationship was between transgressions and betrayal ( $r_s = .64$ ). Conversely, the highest negative relationship was between burnout and satisfaction ( $r_s = -.62$ ). Table 7 shows the matrix of correlations between transgressions, betrayals, satisfaction, burnout, and stress constructs.

A Regression Analysis to Predict Psychological Constructs Variables

The results for linear regression for the transgressions construct related to the Moral Injury and Quality of Life Scales, constructs responses showed that betrayals have a statistically significant positive effects on the outcome of transgressions. At the same time, burnout and stress were found to have a statistically significant negative effects on transgressions. For example, an increase in one unit of betrayals increases transgressions results by 0.52 units. For burnout, an increase in one unit decreases transgressions by 0.63. For one unit, an increase in stress decreases transgressions by 0.49. Table 8 shows the predictor for the transgression construct.

The results for linear regression for the stress construct with respect to Moral Injury and Quality of Life Scale constructs responses showed that transgressions have a statistically significant negative effect on the outcome of Stress. At the same time, burnout was a statistically significant positive effect on stress. For example, increasing one unit of transgressions decreases stress results by -0.11 units. For burnout, an increase in one unit of burnout increases stress by 0.26. Table 9. Shows the predictor for Stress construct.

#### **4) Utilize focus groups to better understand the underlying psychological impact on caretakers when performing on farm euthanasia that may not have been identified by the surveys.**

After the quantitative data were analyzed, a qualitative study was performed by transcribing and coding different focus groups with swine caretakers, where the results showed: (1) reasons for swine caretakers' stress, (2) the importance of work experience to perform euthanasia, and (3) potential training to improve caretakers' mental health. Participants mentioned the principal stressors, such as high workload and lack of personnel, slow pig death, the need for equipment and facilities improvement and maintenance, and stress for accomplishing the farm production goals; veterinarians report they perform good practices and do everything they can to save compromised pigs but not even this they can't save the animal life, time management and accomplishment of the daily activities is also a stressor for caretakers. Participants stated that the more euthanasia is performed, the easy the process becomes; different areas of study show variation in knowledge about the process and current on-farm euthanasia methods, cultural barriers, and euthanasia performance experience are also identified as experiences that impact the euthanasia decision-making. Lastly, some potential training topics were prepared to reduce the fear of getting hurt themselves or coworkers, thanatology therapy, emotional intelligence in performing euthanasia decisions and caretaker work recognition. Participants express they do not like to euthanize pigs, but they do know it is necessary for animal welfare. Caretakers also mentioned the interest and importance of including mental health in their work. Overall, the previous results bring us the opportunity for future interventions to improve swine caretakers' mental health. Therefore, this could contribute to the enhancement of animal welfare in swine production farms.

## **Discussion:**

### **1) To Develop and Validate an Instrument to Identify Swine Caretakers' Attitudes Toward Pig Euthanasia.**

This instrument was developed and validated using demographic and swine management questions; in addition, current scales from other fields were adapted for swine industry caretakers. According to Griner & Smith (2006), a culturally adapted mental health intervention analysis indicated that experiences of anxiety, depression, work-related stress, and help-seeking behaviors vary across cultures and other demographic variables. In a study by Mullins et al. (2017) managers also suggested that cultural factors might contribute to the delay in timely euthanasia. Therefore, the first two survey sections, Demographic characteristics, and Swine Management, aimed to identify caretakers' attitudes towards pig euthanasia. The Impact of Event Scale section in this study was not used for further inferential analyses (as it did not show variability on the results). An investigation that used this instrument to assess psychometric properties in a sample of Italian flood victims showed that the Impact of Event Scale-R scales presented satisfactory values of internal consistency and acceptable values of correlation with other scales, it was added as part of the discussion that some items did not fit well in the proposed solution. They also suggest the necessity of further studies to verify some aspects of the validity. Nonetheless, they found that the instrument was adapted usefully for research and practice (Craparo et al., 2013).

In assessing Spanish-speaking swine caretakers' attitudes towards pig euthanasia, The Moral Injury did not show any variability, the lack of variability may have been instrument-dependent. Where the scale presented a measurement error that could be due to inadequate design or an incorrect type of question, it may not be interpreted the same in Spanish as in English, effects of the environment or circumstances of the measurement, or a combination of these. The Professional Quality of Life Scale is intended for any helper-health care professionals, social service workers, or teacher responses to understand the positive and negative aspects of helping those who experience trauma and suffering (ProQoL, 2022). Additionally, this scale has been used to determine stress and burnout in healthcare professionals, particularly nurses, and the contribution to the validation of the Portuguese version of the Professional Quality of Life Scale (Duarte, 2017). A preliminary study exploring caretakers perspectives of euthanasia on swine operator implemented an instrument that included the following sections (1) *demographic variables*, (2) *euthanasia method and training section*, (3) *euthanasia decision-making*, (4) *attitudes toward performing on-farm euthanasia*, and (5) *work environment and communication*. The researchers concluded that physical and mental health resources should be available to workers to promote well-being, improve job performance, and greater job satisfaction (Simpson et al., 2020). The job satisfaction construct was analyzed as part of this study using the Professional Quality of Life Scale for Spanish-speaking caretakers. The use of this scale may give a higher understanding not only about satisfaction but also about the burnout and stress constructs. The Moral Injury Event Scale perceives the caretaker's violation of moral beliefs or betrayal by self or others. A psychometric evaluation applied in the military

has helped clinicians and researchers measure moral injury. Participants have been exposed to war-zone combat experiences, and the results showed that this survey is valid for identifying factors of perceived transgressions and betrayals (William et al., 2013). These findings suggest the importance and viability of restructuring and implementing this instrument in critical fields, such as the swine industry. This is the first study where surveys of this nature are integrated and validated to assess pig caretakers' attitudes toward pig euthanasia, with a specific focus on the Spanish-speaker population. These scales serve as an opportunity to identify and better understand the moral stress associated with euthanasia and the effect on swine caretakers.

A recent study evaluated if euthanasia attitudes of Mexican TN-Visa swine caretakers differ by gender (female or male). It surveyed nine demographic questions and 31 questions adapted from Rault et al. (2017), categorized by (a) *confidence*, (b) *knowledge*, (c) *decision*, and (d) *comfort*. Results indicated that regardless of gender, median caretakers' answers indicated they did not have difficulty deciding when to perform euthanasia. Also, participants indicated to be confident in identifying illness and health outcomes and knowing when to perform euthanasia (Yarian, 2022). This study shows the growing importance of filling the gap of the impact that euthanasia has on swine caretakers. Moreover, the importance of gender differences. Considering the complexity of psychological and socio-cultural barriers, this exploratory study demonstrated the necessity of proposing other methodologies to understand Spanish speakers' context regarding pig euthanasia.

## **2) To Assess and Describe Swine Caretakers' Attitudes Toward Pig Euthanasia Using the Developed Surveys.**

Demographic results showed that 31.9% ( $n = 52$ ) of participants in this study were female. This result shows a relevant percentage of women's participation in the swine industry. Unfortunately, not much has been studied about women's roles in this field. However, the United States Department of Agriculture (USDA) census showed that the statistics for female agricultural producers in the U.S between 2012 and 2017 increased by 27%. In addition, the percentage of women in swine farming increased from 9% to 10% of the total swine producers at a farm (USDA, 2017). These increments in the women population in the swine field demonstrate the need for studies focused on gender influences on swine caretaker practices.

On the other hand, a census reported that more than half (57 %) of swine producers were between 45-64 years old (USDA, 2012). However, 71.2% ( $n = 116$ ) of the caretakers in our study were 18-35 years of age. Almost all participants in this study were from Mexico, 96.9% ( $n = 158$ ). This could be related to the NAFTA professional (TN) visa requirements, as applicants must be Mexican or Canadian to opt for this work permit. Level of education and education major results must be considered as part of this requirement. The conditions for this visa include that workers must have a profession on the NAFTA visa list and the professional needs qualification and education related to the work field sought (U.S Citizen and Immigration Services, 2021).

According to the Iowa State Data Center, the general per capita income in 2019 was \$33,107. These numbers are very similar to the 41.7 % ( $n = 68$ ) of caretakers in two category groups that showed an annual income between \$29,000 and \$ 39,000. Around 34.4% ( $n = 56$ ) of participants earn less than this amount, and just 16% ( $n = 26$ ) of caretakers earn more than the per capita income in Iowa State. Lower income may result in a non-conformity with the economy and could be interesting to evaluate if it affects caretakers' Job Satisfaction.

The results associated with time working in the farm and the swine industry were similar. This may be due to the fact that for most of the caretakers working on this swine farm, it is their first and only experience within this industry. Thus, a large number of participants in this study started working in the swine industry as their first farm job. Thus, for most of the participants working at a swine farm was their first and only experience within this industry.

The farm work unit participants' responses varied in refernc to the knowledge of the Common Swine Industry Audit (CSIA;  $p = .005$ ). Participants' results showed that 53.47% of the farrowing unit caretakers were unaware of the CSIA, while 26.83% of the breeding unit lacked awareness of this audit. Similarly, 27.78% of participants that work in both units do not know what the CSIA is. These significant results may be due to the different tasks caretakers perform during their daily inspections of barns. Each farm work unit is diverse in techniques that caretakers must conduct to achieve their particular unit production goals (Rea, 2018).

In a study by Mullins et al. (2017), 72 participants, representing 44.17% of the sample, showed a lack of awareness of the CSIA. The deficiency in awareness about these guidelines/standards is concerning, since failure to euthanize injured pigs may lead to increased animal suffering, compromised animal welfare, and financial losses. Our results indicated that as experience and time working on the farm increases, so does caretakers' confidence in their ability to identify and conduct swine euthanasia ( $p < .001$ ). More than half (52.27%) of the workers with less than a year of experience were undecided about when a pig needs to be euthanized and preferred not to perform euthanasia themselves. On the other hand, more than three-quarters (78.79%) of workers with more than three years of experience felt capable of identifying injured pigs and performing euthanasia themselves. Considering these results, one of the reasons for the inexperienced workers' unwillingness to euthanize may be their self-distrust. Similarly, a study that investigated employee's perceptions of pig euthanasia determined by how long workers have been euthanizing and their ability to perform euthanasia by themselves. Hence, the more time employees perform pig euthanasia, the more willing they are to conduct this practice (Mattis et al., 2005). These data indicate that caretakers with more experience working with pigs and performing euthanasia feel confident in their ability to identify and conduct this process.

Furthermore, a recent study of animal caretakers' perspectives on performing euthanasia on commercial sow farms indicated that euthanasia becomes easier the more times it is performed, relating this to the skills that caretakers obtain with experience (Edwards, 2020). At the same time, an investigation focused on Austrian veterinarians' attitudes towards euthanasia showed that veterinarians who have worked for fewer years performing

this process were more likely to disagree with it in some convenience scenarios (Hartnack et al. 2016). The findings of the previous research and this study support the perception that caretakers' lack of experience may negatively affect their preferences in performing euthanasia.

As experience and time working on the farm increases, so does caretakers' awareness of the CSIA ( $p < .001$ ). The results for participants with less than a year of experience at the farm indicated that 77.27% of caretakers were not aware of the CSIA. However, 33.72 % of caretakers with one to three years of experience showed knowledge about the CSIA. Most alarming, 27.27% of the most experienced operators were unaware of the CSIA standards. These results manifest the need to strengthen education and training around swine industry standards to ensure timely and humane pig euthanasia when specific conditions are met. The CSIA standards are critical guidelines to ensure animal welfare. However, 72% of workers are unaware of these guidelines, representing a significant welfare concern due to the delay in timely euthanasia. The lack of standards-based knowledge does not allow the workers to follow these guidelines. This statement agrees with a study identifying the euthanasia perspectives of Spanish-speaking TN-Visa swine caretakers on a commercial sow farm where avoiding euthanasia showed to compromise the animal's welfare and contributed to non-compliance with audit procedures (Yarian, 2021).

In the Moral Injury Event Scale did not show perceived betrayal and transgression feelings. This scale has been previously used with veterans by Norman and Maguen (2022) and helped to understand morally injurious events in the context of war, such as killing or harming others. Some of the recommendations for this study were to apply an empirical evaluation of the model, do longitudinal studies of course and associated factors, and distinguish between witnessing, perpetration, and betrayal. Norman and Maguen (2022) also concluded that moral injury can lead to Post Traumatic Stress Disorders, depression, and other disorders in which feelings such as guilt, shame, betrayal, and anger are predominant, although these feelings may occur in the absence of a formal disorder. (Norman & Maguen, 2022). In a study by Wisco et. al (2017) about moral injury in U.S. combat veterans reported 25.5% endorsed transgressions by others, and 25.5% endorsed betrayal, these constructs were assessed using the Moral Injury Event Scale. The adaptation of these scales has helped us compare and understand how scales related to feelings and experiences in other fields can also be used on-farm for workers who perform pig euthanasia.

#### Differences of comparison by gender

There was no difference between the perspectives of male and female participants concerning euthanasia. However, gender results showed a difference in stress ( $p = 0.03$ ) and job satisfaction ( $p = 0.02$ ) between male and female caretakers performing pig euthanasia. Yarian (2022) evaluated if caretaker attitudes toward euthanasia differed between females and males, but differences in confidence, comfort, knowledge, and decision-making attribute factors were not reported. Yet, Matthis (2005), who surveyed Spanish-speaking workers determined that female employees had more negative attitudes toward pig euthanasia. Our results support significant gender differences when performing pig euthanasia; as well as higher stress and lower satisfaction than males.

In a study comparing the relationship between workers and animals in the swine industry, Porcher (2011) mentioned that women are forced to repress their spontaneous affection toward the animals. A study that evaluated mental health among Latina farmworkers and other employed Latinas showed that female farmworkers, compared with non-farmworkers and unemployed women, had higher stress and anxiety (Arcury, 2018). These results indicate a problem inside the agricultural industry and are essential factors that should be considered for reducing gender inequality in the swine industry. The study's authors also highlighted the critical aspect of work-family balance, which disproportionately affects women's work and personal stress levels. For instance, a study about stress and depression among Latina women in rural areas in North Carolina identified the Latina population's mental health as poor, where high levels of depression and stress presented significant risks to their health (Jane, 2011). Some of the most critical stressors affecting their lifestyle include marital status, lack of finances, language barriers, and difficulty being away from family members. Connecting to our study, women's stress and job satisfaction may be affected by external events in their daily personal life.

### Correlations Between Stress and The Moral Injury Event Scale

The Professional Quality of life and Moral Injury Event Scales results in this study found a significant correlation between constructs. Stress was negatively correlated with the professional quality of life scales (betrayal and transgressions). In a study on compassion fatigue in animal shelter employees, Moral Injury Event Scales were also negatively correlated with Secondary Traumatic Stress; thus, the trauma experienced by animal care employees may be due to Moral Stress (Andrukonis, 2018). At the same time, it might imply that swine caretakers also are affected by moral stress.

### Prediction of Constructs

The Transgressions model showed that an increase of one unit of Betrayal increases Transgressions by 0.54. Similar findings were found by Bohanec, (2013), who reported that due to caretakers' responsibilities, sacrificing an animal's life could be one of the worst personal transgressions they could experience, and since they are responsible for the pig over time, euthanizing an animal that feels trust in the caretaker could cause betrayal feelings from caretakers towards the pig. Additionally, it has been found that the increase in personal transgressions increases caretakers' stress (Newsome et al., 2019) and creates burnout for caretakers (Kogan et al., 2020; Yarian, 2021).

The burnout model showed that an increase of one unit of stress increases burnout by 0.13. Similar information was found by Rabinowitz et al. (2015) and Newsome et al. (2019), who found that caretakers that work closely with animals presented higher fatigue, which increases the caretakers' stress, ending up in increased work burnout and generates constant job turnover (Rogelberg et al., 2007). Scotney et al. (2015) found that occupational stress increases as a consequence of euthanasia-related strain on animal care personnel.

**3) Utilize focus groups to better understand the underlying psychological impact on caretakers when performing on farm euthanasia that may not have been identified by the surveys.**

Participants mentioned the principal stressors, such as high workload and lack of personnel, slow pig death, the need for equipment and facilities improvement and maintenance, and stress for accomplishing the farm production goals; veterinarians report they perform good practices and do everything they can to save compromised pigs but not even this they can't save the animal life, time management and accomplishment of the daily activities is also a stressor for caretakers. Participants stated that the more euthanasia is performed, the easier the process becomes; different areas of study show variation in knowledge about the process and current on-farm euthanasia methods, cultural barriers, and euthanasia performance experience are also identified as experiences that impact the euthanasia decision-making.

Findings from a recent qualitative analysis of focus groups with swine industry experts (Mullins et al., 2017) indicated that managers believed that logistical, economic, emotional, and cultural barriers contributed to a delay in timely euthanasia decisions for their staff. Missing from Mullins and colleagues' investigation were interviews with actual caretakers, which the investigators acknowledged had left questions unanswered regarding caregivers' direct experiences and beliefs about barriers to timely euthanasia. Interviewees voiced the belief that as a group, competent caretakers are vested in sustaining the lives of pigs, and this aspect of their occupational role may be at odds with performing euthanasia. Furthermore, the managers believed that cultural issues may also play a role in the delay of timely euthanasia (Mullins et al., 2017). And, in fact, managers lacking cross-cultural communication skills may contribute to employee dissatisfaction and stress (Garcia-Pabon, 2014).

#### **4) To establish a framework on which future intervention strategies based on our findings can be used to improve animal welfare, caretaker morale/mental health, and job satisfaction.**

Provide efficient training that helps improve practices in the swine industry as training caretakers to identify and perform euthanasia confidently and competently. Focusing on personnel with difficulty making euthanasia decisions and less experience and improvement of participation and understanding of effective euthanasia practices.

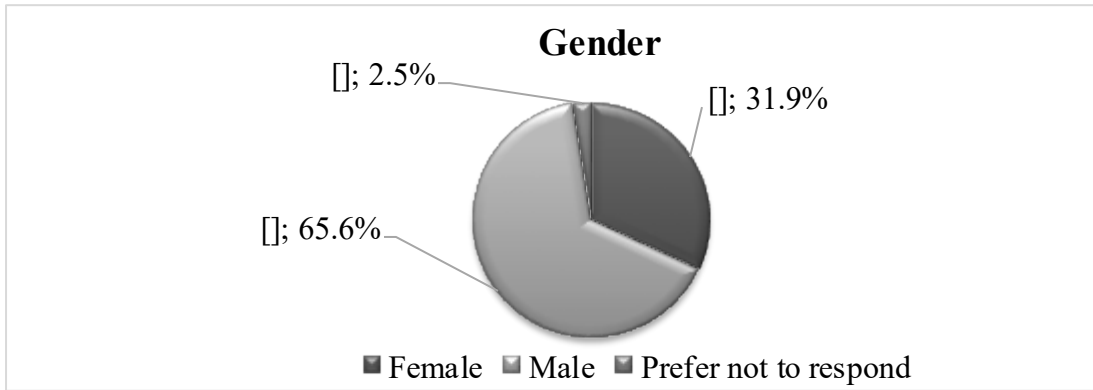
Establish a framework for strategies based on gender weaknesses and inequality providing welfare to the animal but considering workers' mental health. Develop training for women caretakers performing euthanasia and look for ways to help understand how stress and transgressions affect caretakers' daily and labor life and to provide skills that may reduce these effects on pig caretakers.

Lastly, some potential training topics were identified to reduce the fear of getting hurt themselves or coworkers when performing the euthanasia process, thanatology therapy is one of the mentioned by the participants and also accurate to help with the barriers that may delay the euthanasia performance this therapy could have the capacity to create a deeper understanding about pigs death. Psychological monitoring may help swine caretakers to improve their emotional intelligence in performing euthanasia decisions, caretaker work recognition was mentioned several times by the workers as something they would like people should do about the practices they perform at the farm. Work recognition may be a motivation and a way to improve job satisfaction and reduce stress in the same way. Participants express they do not like to euthanize pigs, but they do know it is necessary for animal welfare. Caretakers also mentioned the interest and importance of including mental health in their

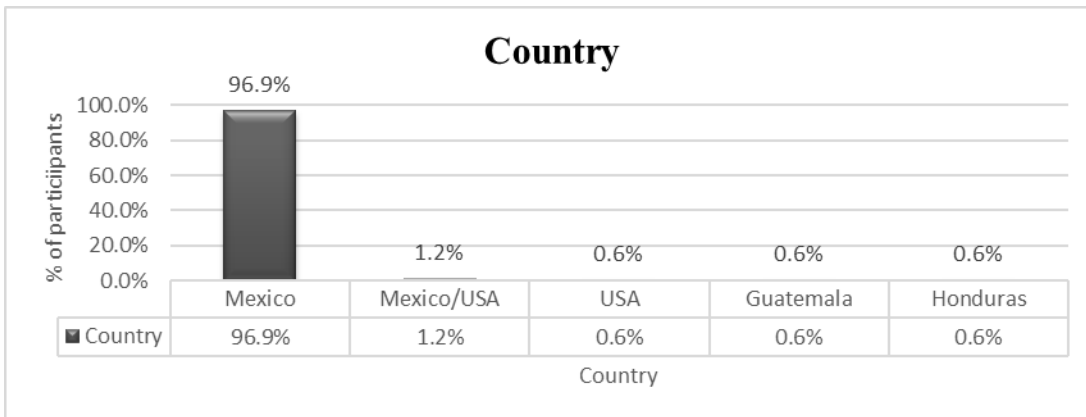


work. Overall, the previous results bring us the opportunity for future interventions to improve swine caretakers' mental health. Therefore, this could contribute to the enhancement of animal welfare in swine production farms.

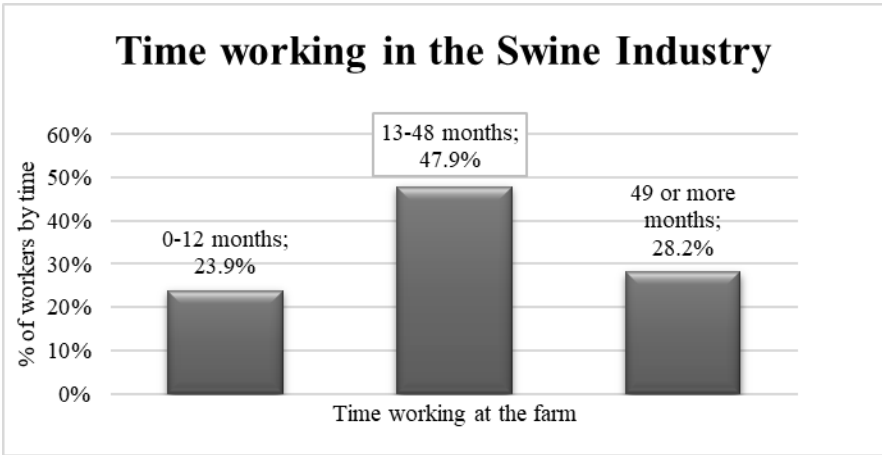
**Figure 1**  
Distribution of Participants by Gender



**Figure 1**  
Distribution of Participants by Country

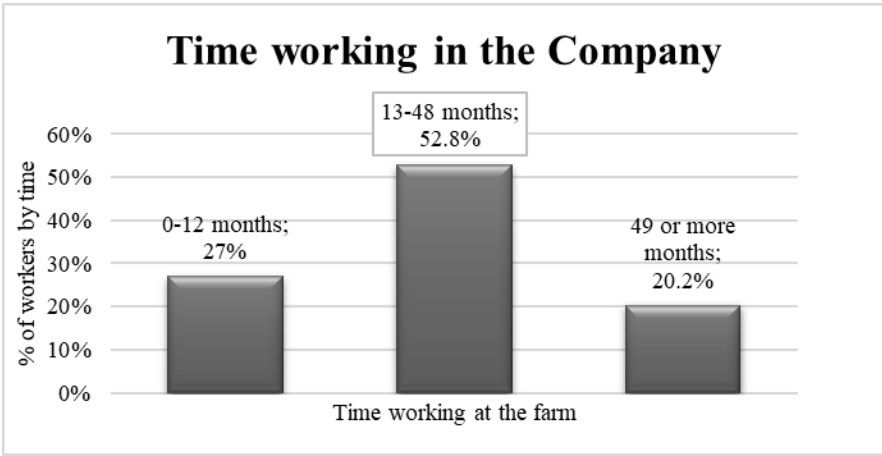


**Figure 2**  
Distribution of Participants by Time Working in the swine industry



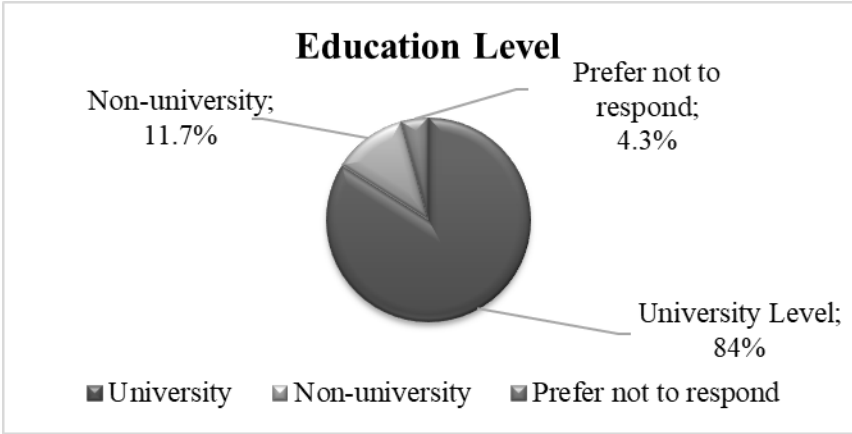
**Figure 3**

Distribution of Participants by Time Working at the Farm



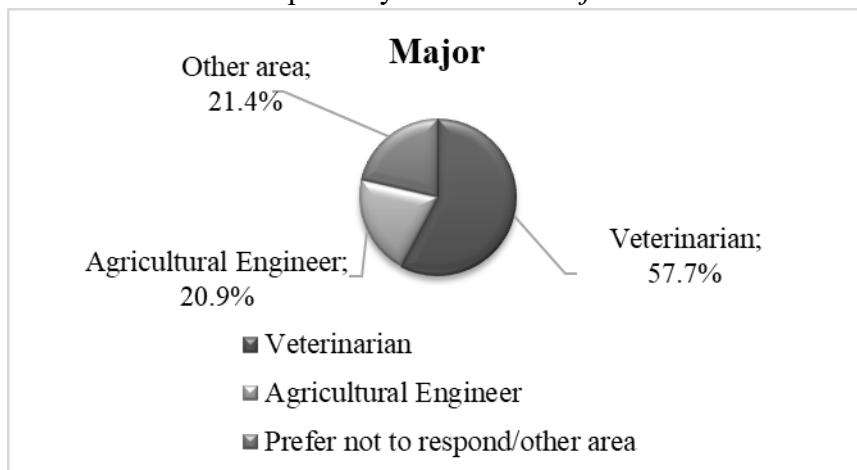
**Figure 4**

Distribution of Participants by *Educational Level*



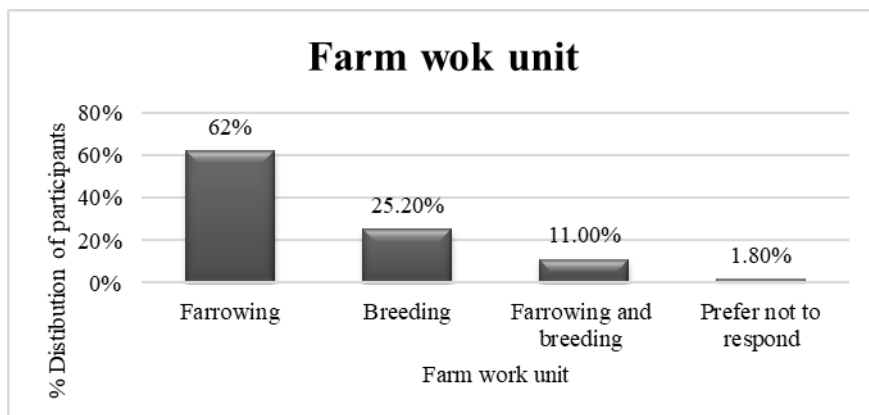
**Figure 5**

Distribution of Participants by Education *Major*



**Figure 6**

Distribution of Participants by Farm work unit



**Tables**

**Table 1.**

*Frequencies for Participant's Age and Income Distribution Variables.*

Characteristic	n	%
Age (years)		
18-35	116	71.2
36-45	34	20.9
46-more	11	6.7
Prefer not to respond	2	1.2
Income (\$/per year)		
19,000-24,000	30	18.4
24,001-29,000	26	16.0
29,001-34,000	43	26.4
34,001-39,000	25	15.2
39,001-more	26	16.0

**Table 2**  
*Frequencies for Swine Management section*

Item	Yes		No	
	<i>n</i>	%	<i>n</i>	%
1 I deal with sick or injured pigs	163	100	0	0
2 I can differentiate a healthy pig from a sick/injured one	163	100	0	0
3 I was formally trained (with videos, by a supervisor or trainer) to recognize sick/injured pigs	156	95.7	7	4.3
4 I have enough time in my shift to recognize the sick/injured pigs	159	97.5	4	2.5
5 I wait for another person to recognize the sick/injured pigs, and did not do it myself	9	5.5	154	94.5
6 I know what a hospital/isolation pen is (hospital pen)	156	95.7	7	4.3
7 I know why pigs are moved to hospital pens.	158	96.9	5	3.1
8 I believe that hospital pens benefit sick/injured pigs.	156	95.7	7	4.3
9 I regularly check the hospital/sick pens.	135	82.8	28	17.2
10 I complete the records when I move pigs to sick/hospital pens.	148	90.8	15	9.2
11 I know what the Common Swine Industry Audit (CSIA) is.	91	55.8	72	44.2
12 Euthanasia of pigs is part of my job.	163	100	0	0
13 Part of my job is telling others when to euthanize a pig.	129	79.1	34	20.9
14 I like to euthanize pigs.	94	57.7	69	42.3
15 I know when a pig must be euthanized immediately according to the Euthanasia plan of my farm.	160	98.2	3	1.8
16 It would be easier for me if someone else identified the sick /injured pigs that need to be euthanized and then I euthanize them.	32	19.6	131	80.4
17 It would be easier for me to identify sick/injured pigs and then someone else euthanized them.	55	33.7	108	66.3
18 If I see a pig that should be euthanized (according to the criteria of the plans of Action / SOP from my farm), I euthanize it immediately	154	94.5	9	5.5
19 I decide when an animal needs to be euthanized and perform the euthanasia by myself.	117	71.8	46	28.2

**Table 3***Frequencies of The Professional Quality of Life Scale*

Item	<i>SE</i>	<i>SD</i>	<i>Mean</i>	<i>Mode</i>	<i>Median</i>
1 I am happy	.056	.716	4.28	4	4
2 I am worried about more than one of the animals I help.	.079	1.013	3.73	4	4
3 I get satisfaction from being able to help animals.	.050	.634	4.65	5	5
4 I feel connected to animals.	.085	1.082	3.33	3	3
5 I jump or am startled by unexpected sounds.	.080	1.025	1.13	1	2
6 I feel invigorated after working with animals.	.076	.975	3.27	3	3
7 I find it difficult to separate my personal life from my Laboral life.	.083	1.054	1.98	1	2
8 I am not as productive at work because I am losing sleep over traumatic experiences of the animals that I help.	.053	.677	1.25	1	1
9 I think that I might have been affected by the traumatic stress of those animals I help.	.052	.667	1.27	1	1
10 I feel trapped by my job.	.087	1.112	1.85	1	1
11 Because of my help, I have felt "on edge" about various things.	.074	.948	1.95	1	2
12 I like my work.	.069	.884	4.39	5	5
13 I feel depressed because of the traumatic experiences of the animals I help.	.052	.667	1.33	1	1
14 I feel as though I am experiencing the trauma of the animals I help.	.063	.800	1.42	1	1
15 I have beliefs that sustain me I, my work.	.097	1.241	3.59	4	4
16 I am satisfied with the way in which I can handle the techniques and protocols of my work.	.068	.873	4.21	5	4
17 I am the person I always wanted to be.	.073	.944	4.07	4	4

18 My work makes me feel satisfied.	062	.797	4.21	4	4
19 I feel worn out because of my work.	079	1.011	2.91	3	3
20 I have happy thoughts and feelings about those animals I help and the ones that I can help too.	068	.867	4.02	4	4
21 I feel overwhelmed (burnout) because my workload seems endless.	087	1.105	2.57	3	3
22 I believe I can make a difference through my work.	065	.829	4.10	4	4
23 I avoid certain activities or situations because they remind me of frightening experiences with the animals I help.	069	.875	1.43	1	1
24 I am proud of what I can do by helping the animals.	064	.823	4.26	4	4
25 As a result of my helping animals, I have intrusive, frightening thoughts.	055	.703	1.22	1	1
26 I feel "bogged down" by the system.	087	1.11	2.08	1	2
27 I have thoughts that I am a "success" in my work.	078	1.000	3.67	4	4
28 I can't remember traumatic parts of my work with animals.	104	1.326	2.01	1	1
29 I am a person who really cares about animals.	050	.638	4.57	5	5
30 I am happy that I chose this job.	067	.857	4.31	5	5

**Table 4.**  
*Frequencies of The Moral Injury Event Scale*

Question	SE	SD	Mean	Mode	Median
1 I saw things that were morally wrong	123	1.58	4.36	6	5
2 I am troubled by having witnessed others' immoral acts	132	1.69	4.23	6	5
3 I acted in ways that violated my own moral code or values	117	1.50	4.89	6	6
4 I am trouble by having	140	1.79	4.37	6	5

Question	SE	SD	Mean	Mode	Median
acted in ways that violated my own morals or values					
5 I am troubled because I violated my morals by failing to do something that I felt I should have done	1.141	1.80	4.30	6	5
6 I feel betrayed by leaders who I once trusted	1.141	1.85	4.31	6	5
7 I feel betrayed by coworkers I once trusted.	1.128	1.64	4.37	6	5
8 I feel betrayed by others outside of my job that I once trusted	1.127	1.62	4.58	6	5
9 I trust that my leaders and co-workers will always live up to their core values	1.123	1.57	2.75	1	2
10 I trust myself to always live up to my own moral code.	1.126	1.65	1.92	1	1

**Table 5**

*Frequencies and Difference of Medians for Gender and University Level in The Professional Quality of Life Scale constructs.*

	Stress			Satisfaction			Burnout		
	<i>M</i>	<i>SD</i>	<i>Md</i>	<i>M</i>	<i>SD</i>	<i>Md</i>	<i>M</i>	<i>SD</i>	<i>Md</i>
Gender ( <i>n</i> = 159)									
Male ( <i>n</i> = 52)	1.56*	0.44	1.44	4.18*	0.51	4.20	1.99	0.52	1.89
Female ( <i>n</i> = 107)	1.77*	0.57	1.67	4.02*	0.43	4.00	2.11	0.49	2.11
Education level ( <i>n</i> = 156)									
University ( <i>n</i> = 137)	1.61	0.49	1.56	4.13	0.48	4.10	2.04	0.52	2.00
Non-University ( <i>n</i> = 19)	1.77	0.58	1.67	3.89	0.54	3.80	2.09	0.47	2.11

*Note.* \*  $p < 0.05$  significance

**Table 6**

*Frequencies and Difference of Medians for Gender and Education Level in the Moral Injury Event Scale Constructs.*

	Betrayal			Transgressions		
	<i>M</i>	<i>SD</i>	<i>Md</i>	<i>M</i>	<i>SD</i>	<i>Md</i>
Gender ( <i>n</i> = 107)						
Male ( <i>n</i> = 52)	4.45	1.32	4.67	4.43	1.29	4.60
Female ( <i>n</i> = 107)	4.30	1.48	4.50	4.55	1.39	4.80
Education level						

(n = 156)						
University (n = 137)	4.35	1.40	4.67	4.13	0.48	4.1
Non-University (n = 19)	4.63	1.05	4.67	3.89	0.54	3.8

*Note.* \*  $p < 0.05$  significance

**Table 7**

*Matrix of correlations (n = 163)*

Variable	1	2	3	4	5
1. Transgressions	-				
2. Betrayal	.64*	-			
3. Satisfaction	.21*	-.014	-		
4. Burnout	-.37*	-.18*	-.62*	-	
5. Stress	-.39*	-.27*	-.27*	.37*	-

*Note.* \* $p < .01$

**Table 8**

*Linear result regressions for Transgressions (N = 163)*

Variable	Coefficient	Standard Error
Intercept	4.14*	1.24
Betrayal	0.52**	0.06
Satisfaction	0.02	0.20
Burnout	-0.63*	0.21
Stress	-0.49*	0.17
<b>R<sup>2</sup></b>	0.51	

*Note.* The t-statistics are denoted as \*\* $p < 0.01$  and \* $p < 0.05$

**Table 9**

*Linear Result Regressions for Stress (n = 163)*

Variable	Coefficient	Standard Error
Intercept	1.82	0.58
Transgressions	-0.11*	0.36
Betrayal	-0.02	0.03
Satisfaction	-0.04	0.09
Burnout	0.26*	0.10
<b>R<sup>2</sup></b>	0.26	

*Note.* The t-statistics are denoted as \*\* $p < 0.01$  and \* $p < 0.05$