

RANCH EMPLOYEE SAFETY

Working Cattle and Related Facilities and Equipment



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INTRODUCTION

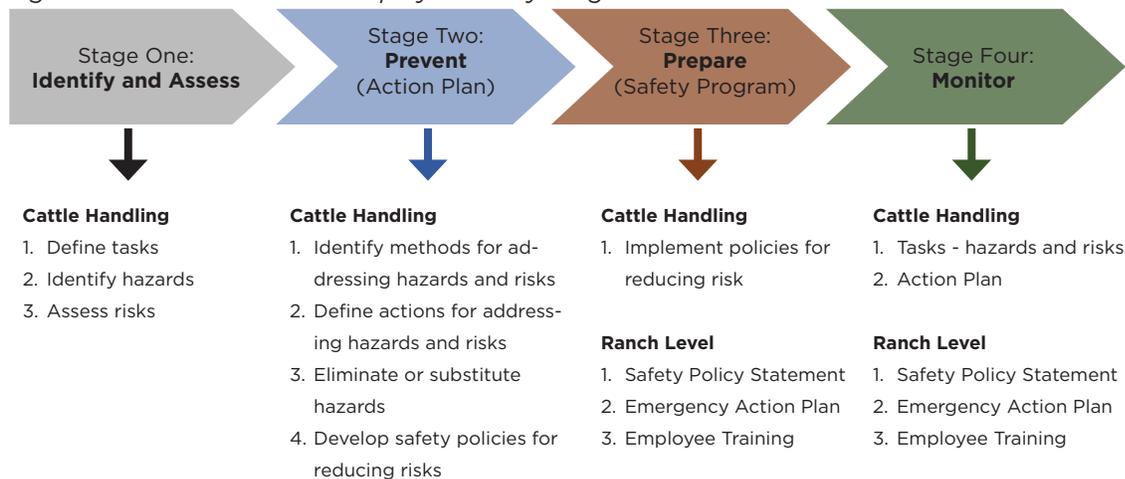
Agriculture is the seventh most hazardous industry in the United States. For example, the 2018 fatal work injury rate per 100,000 full-time equivalent workers in agriculture was 22.8¹. As a ranch owner/operator, you are aware of these hazards and risks. You want to create a work environment that is as safe as possible and that minimizes injuries so you and your workers can go home safely at the end of the day. This Ranch Employee Safety module provides information related to reducing hazards and risks associated with working beef cattle and will help entrepreneurs like you plan an effective cattle-working safety program. This module consists of an overview of a recommended process for developing and implementing a ranch safety program focusing on working cattle; four sections detailing the stages of the effort; and resources for implementing the cattle-working safety program.

OVERVIEW

It can be overwhelming to develop safety and health procedures and programs for your ranching operation. Fortunately, there is a four-stage safety program process that can be adapted to your ranch to help you develop a program that can be implemented easily and effectively. The four stages of developing a safety program are:

- **Stage One: Identification of the hazards and assessment of the risks** to workers' safety and health that may arise during the course of their work.
- **Stage Two: Prevention of worker injuries and illnesses** by developing an action plan to eliminate the hazards or reduce the risk associated with exposure to the hazards. This is a proactive way of reducing occupational injuries and illnesses.
- **Stage Three: Preparation of ranch employees** for reducing their exposure to hazards and risks associated with their work by communicating with them the safety policies associated with working cattle providing a ranch-level safety policy statement, creating an emergency action plan and conducting employee training.
- **Stage Four: Monitoring of the hazards and risks** and the safety policies and procedures implemented to reduce occupational injuries and illnesses.

Figure 1. Overview of Ranch Employee Safety Program Process



¹ <https://www.bls.gov/news/release/cfoi.t03.htm>

The following sections describe these four stages for addressing ranch employee safety and health associated particularly with working your cattle and related facilities and equipment. To help you apply the process outlined in the following sections, an example is provided throughout the descriptions for your reference. In addition, the entire example appears in Appendix A.

STAGE ONE (S1): IDENTIFY AND ASSESS

The first stage (S1) for establishing a ranch employee safety program is to identify the hazards associated with working your cattle and assess the risks to worker safety and health. This stage involves the following steps²:

- 1. **S1: Step One:** Define the tasks associated with working cattle on your ranch.
- 2. **S1: Step Two:** For each task, identify the hazards, sources of the hazards, workers who might be impacted if the hazards were to occur, and injuries or illnesses that might result in the event of the hazards occurring.
- 3. **S1: Step Three:** For each task, assess the risks associated with the hazards.

S1: Step One - Define the Tasks

Step One involves defining the tasks related to working cattle on the ranch that have potential to cause worker injury or illness. There are many tasks that fall under the category of “working cattle.” Since these tasks most likely differ from ranch to ranch, this module does not explicitly suggest the specific tasks related to working beef cattle other than in the example provided throughout. Nonetheless, the described process for identifying hazards and assessing risks will be applicable for each of the cattle-working tasks relevant to your ranch.

S1: Step Two - Identify the Hazards, Sources, At-Risk Workers and Potential Injuries/Illnesses

The second step involves identifying:

- 1. The hazards associated with each task pertaining to working cattle on your operation.
- 2. The sources of the hazards.
- 3. The workers who might be harmed or become ill if the hazards, including hazards associated with the facilities and equipment involved with working the cattle, were to occur.
- 4. The possible injuries and/or illnesses that could result if the hazards were to occur.

Working Cattle Safety Program Example

S1: Step One - Three tasks associated with working cattle were defined:

- 1. Working cattle in a cattle chute (also called alley or run)
- 2. Working cattle in a squeeze chute
- 3. Restraining/handling calves that are at their mothers' sides

S1: Step Two - Hazards, sources, workers and injuries were identified:

- 1. Task: Working cattle in cattle chute
- 2. Hazard: Animal becomes frightened
- 3. Source: Vision - unexpected movement to side
- 4. Worker impacted: cattle chute handler
- 5. Potential injury: Bodily injury to face, head, torso or limb

See Appendix A for the complete description of the example

² These steps are loosely adapted from the International Labour Organization’s (ILO) “Code of Practice on Safety and Health in Agriculture.”

When identifying the hazards, you should consider:

1. How the methods for working your cattle are organized, managed and implemented
2. The design, fabrication and installation of your cattle-working facilities, equipment and work processes
3. The contracting of facilities, equipment, services and labor on your operation, including the specifics of your agreement with contractors and the responsibilities to and by contractors
4. The inspection, maintenance, testing, repair and replacement of your facilities and equipment

It might also be helpful to think of the sources of hazards caused by working cattle on your ranch as falling into three general categories:

1. Cattle senses (vision, hearing, etc.)
2. Cattle instinct, temperament and genetics
3. Previous experience

Factors or traits related to these hazard sources and the implications of these hazards for these categories are described in Appendix B. It is impossible to identify all the hazards or all the sources of hazards, but to help get started, you could pick out the hazards that occur most frequently on your ranch or have the biggest risks associated with them.

Resources

The following resources can help you identify hazards on your operation. This is not intended to be an exhaustive list but is the result of years of scientific research and practical experience.

- *Behavioral Principles of Livestock Handling*, Temple Grandin, Ph.D. 2018 Update.
<https://www.grandin.com/references/new.corral.html>
- *Safe Cattle Handling; Good Practice Guidelines*. New Zealand Government. 2014.
<https://www.zeroharmfarm.com/saferfarms/safe-cattle-handling.pdf>
- *Cow Talk, Understanding Dairy Cow Behaviour to Improve Their Welfare on Asian Farms*, Chapter 4, Cattle behaviour, John Moran and Rebecca Doyle,
https://www.publish.csiro.au/ebook/chapter/9781486301614_Chapter4
- *Beef Cattle Behavior and Handling*, Brandi Karisch, Jane Parish and Rhonda Vann, Mississippi State University Extension. 2019.
http://extension.msstate.edu/sites/default/files/publications/publications/p2801_web.pdf
- *Animal Behavior and Restraint: Cattle. Just in Time Training*, The Center for Food Security & Public Health, Iowa State University. 2014.
<https://www.cfsph.iastate.edu/Emergency-Response/Just-in-Time/08-Animal-Behavior-Restraint-Cattle-JIT-HANDOUT.pdf>
- *Cattle Handling and Working Facilities*, The Ohio State University Extension. 2002.
<https://agmr.osu.edu/sites/agmr/files/imce/pdfs/Beef/CattleFacilities.pdf>
- *Cattle Handling Safety in Working Facilities*, Oklahoma State University Cooperative Extension Service, BAE-1738.
<http://pods.dasnr.okstate.edu/docushare/dsweb/Get/Document-4821/BAE-1738web.pdf>
- *Cold Stress and Beef Cattle*, David Hartman, Penn State Extension (2016, December 28).
<https://extension.psu.edu/cold-stress-and-beef-cattle>
- *Heat Stress and Beef Cattle*, Stephen Boyles, Oklahoma State University Extension Beef Specialist.
<https://agmr.osu.edu/sites/agmr/files/imce/pdfs/Beef/HeatStressBeefCattle.pdf>

S1: Step Three - Assess the Risks

A risk assessment carefully examines the ranch environment involved with working cattle by evaluating the potential harm to ranch employees if the hazards were to occur. There are many established methods and techniques for assessing the risks. These processes consider both the likelihood of the hazard causing harm to the workers and the severity of the injury or illness if the hazard were to occur. The following is one way you could assess the safety and health risks that arise with working your cattle and the related working facilities and equipment on your operation:

1. Assign a Hazard Likelihood Score for each task by scoring the likelihood the hazard is to occur when the task is taking place. The scores are shown in Table 1.
2. Assign a Consequence Outcome Score for each task and injury/ illness outcome. The three possible injury/illness outcomes are: Minor Injury/Illness, Temporary Disability/Illness and Death or Permanent Disability/Illness. The scores are shown in Table 1.
3. Calculate the Severity Score for each task by summing the three Injury Outcome Scores.
4. Calculate the Hazard Risk Score by multiplying the Hazard Likelihood Score by the Severity Score.

Table 1.

Descriptions for Hazard Likelihood Score and Consequence Outcome Score

Score	Description
1	Rare - happens rarely
2	Unlikely - possible, but it is not expected to happen
3	Possible - could be expected to occur once a year
4	Likely - most likely will occur, but not persistently
5	Certain - occurs regularly

Detail on how you can calculate these scores to assess the hazard risks for your ranch is provided in Appendix C.

Resources

- *Code of Practice on Safety and Health in Agriculture*. International Labour Organization.
https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_159457.pdf
- *BQA National Manual*,
https://www.bqa.org/Media/BQA/Docs/bqa_manual_final.pdf

Working Cattle Safety Program Example

S1: Step Three - Hazard Likelihood Score, Consequence Outcome Score, Severity Score and Hazard Risk Score were calculated for working cattle in a cattle chute:

1. Hazard Likelihood Score: The likelihood that an animal would become frightened is "Possible" (3)
2. Consequence Outcome Score: The likelihood that a worker would suffer a Minor Injury/Illness is "Likely" (4)
3. Severity Score: The individual Consequence Outcome Scores for Minor Injury (4), Temporary Disability (3) and Death or Permanent Disability (1) are summed, resulting in "8"
4. Hazard Risk Score: Hazard Likelihood Score (3) multiplied by Severity Score (8) resulting in "24"

See **Appendix A** for the complete description of the example

STAGE TWO (S2): PREVENT

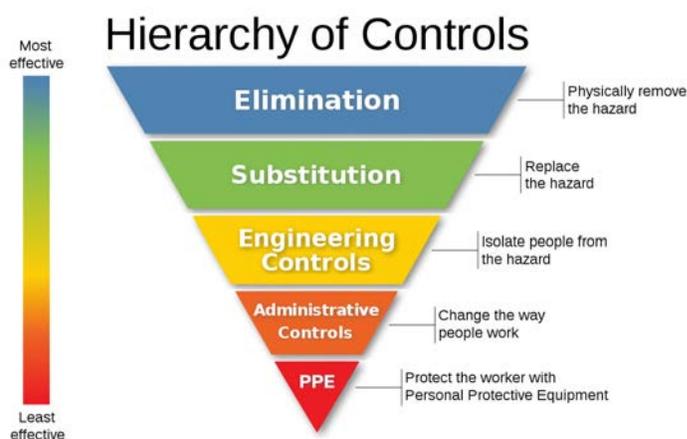
Once you have identified the tasks, their hazards and associated risks in Stage One, you can develop and implement an action plan for eliminating or substituting the hazards, and/or reducing the associated risks. You might not know where to start when identifying ways to address the hazards and risks associated with working cattle on your ranch. Fortunately, there is an established system called “hierarchy of hazard control” that has been designed to help with this activity. It is described in the following section.

Hierarchy of Hazard Control

The hierarchy of hazard control is a well-known system used to eliminate or minimize hazards and manage risks. These hazard control measures are described below and illustrated in Figure 2.

- Eliminate the hazard by physically removing it.
- Substitute the hazard with a less hazardous one.
- Reduce the hazards and risks at the source through the use of engineering controls (isolate workers from the hazard).
- Minimize the hazards and risks through administrative controls that use safe work procedures or other measures (change the way people work).
- Protect the workers with personal protective equipment (PPE) where unacceptable risk remains.

Figure 2. Hierarchy of Hazard Controls



Source: The National Institute for Occupational Safety and Health
<https://www.cdc.gov/niosh/topics/hierarchy/default.html>

Resources

The following resources, while not intended to be an exhaustive list, can be helpful when applying the hierarchy of hazard controls to your operation.

- The National Institute for Occupational Safety and Health
<https://www.cdc.gov/niosh/topics/hierarchy/default.html>
- *Code of Practice on Safety and Health in Agriculture*. International Labour Organization.
https://www.ilo.org/wcmsp5/groups/public/@dgreports/@dcomm/@publ/documents/publication/wcms_159457.pdf
- *BQA National Manual*.
https://www.bqa.org/Media/BQA/Docs/bqa_manual_final.pdf

Develop an Action Plan

The four steps for developing and implementing your action plan are:

1. Step One: For each task, identify or develop
 - a. Procedures for eliminating or substituting the hazards
 - b. Best practices for reducing exposure to the hazards and risks through
 - i. Engineering controls
 - ii. Administrative controls
 - iii. Personal Protection Equipment (PPE)
2. Step Two: Explicitly define the actions needed to implement the procedures and best practices identified in Step One and when the actions will take place. The Hazard Risk Score, calculated in Stage One, can be used to help prioritize the action plan.
3. Step Three: Execute the procedures for eliminating or substituting hazards and/or the engineering controls.
4. Step Four: Develop ranch safety policies based on the best practices identified in Step One for working cattle on your operation.

The following sections describe these steps for developing your action plan to address hazards and risks associated with working your cattle.

S2: Step One - Identify Procedures and Best Practices for Addressing Hazards and Risks

To help identify procedures and best practices for addressing the hazards and risks you have identified, you can implement the hierarchy of hazard controls in any way that best fits your operation, including any combination of the measures. For example, procedures can be identified that can eliminate or substitute hazards. These procedures would focus primarily on the working facilities and equipment. Best practices identified to either help manage the hazards or reduce the risks would fall into the Engineering and Administrative Controls or PPE categories of the hierarchy of hazard controls. These best practices would focus on things that workers could do to decrease the chance of an accident occurring while working cattle.

Appendix D contains a worksheet you can use to record the procedures and best practices you want to consider implementing to address the hazards and risks.

To further aid your efforts in identifying procedures and best practices, Appendices E, F and G provide procedures and best practices for the following three topics:

- Working facilities and equipment
- Cattle behavior and working safety
- Personal protection equipment (PPE)

These appendices are not intended to be exhaustive lists but are provided to give you an overview of industry suggestions for addressing these hazards and risks. These appendices also provide you with resources to help define procedures and practices for reducing the hazards and risks you have identified on your ranch.

Working Cattle Safety Program *Example*

S2: Step One - Working cattle in cattle chute:

1. Eliminate: Use single-file chute with solid walls
2. Engineering Control: Emergency escape plan
3. Administrative Control: Work cattle as quietly as possible
4. PPE: Wear protective clothing such as a strong pair of jeans

See **Appendix A** for the complete description of the example

Cattle Working Facilities and Equipment Safety Best Practices

Every ranching operation is unique in its design and usage of facilities and equipment for working beef cattle. Appendix E contains some best practice information for the design and use of facilities and equipment for working cattle. These best practices focus on eliminating or substituting the hazards and/or using engineering controls to reduce hazards and risks related to cattle-working facilities and equipment.

Cattle Behavior and Working Safety Best Practices

As with the design and use of facilities and equipment for working cattle on your operation, your ranch also is unique regarding how your cattle behave and are handled and cared for. Procedures and best practices have been developed that can be adapted and implemented on your operation to ensure safe conditions for your workers. Appendix F provides best practices relevant to eliminating, substituting or reducing the hazards and risks or for protecting ranch employees from potential hazards related to working with cattle.

Personal Protective Equipment (PPE)

The last control of the hierarchy of hazard controls is personal protective equipment (PPE). Appendix G provides suggestions for PPE that you could implement on your operation to protect your workers from potential hazards related to working with cattle.

Resources for Identifying Procedures and Best Practices to Address Hazards and Risks

The following resources can be helpful when eliminating or substituting the hazards and/or using engineering controls to reduce hazards and risks related to cattle-working facilities and equipment on your operation. These resources are not intended to be an exhaustive list but are the result of years of scientific research and practical experience.

- Pens: *Beef Quality Assurance National Manual*, page 26.
https://www.bqa.org/Media/BQA/Docs/bqa_manual_final.pdf
- Alleys and chutes: *Beef Quality Assurance National Manual*, page 25.
https://www.bqa.org/Media/BQA/Docs/bqa_manual_final.pdf
- *Handling Farm Animals Safely, Farm Safety Association Fact Sheet*.
https://nasdonline.org/static_content/documents/44/d001612.pdf
- Handling tools: *Beef Quality Assurance National Manual*, pages 25-26.
https://www.bqa.org/Media/BQA/Docs/bqa_manual_final.pdf
- Housing facilities: *Beef Quality Assurance National Manual*, page 26.
https://www.bqa.org/Media/BQA/Docs/bqa_manual_final.pdf
- Transportation: *Beef Quality Assurance National Manual*, pages 69-75
https://www.bqa.org/Media/BQA/Docs/bqa_manual_final.pdf
- *Cattle Handling and Working Facilities*, The Ohio State University Extension. 2002.
<https://agmr.osu.edu/sites/agmr/files/imce/pdfs/Beef/CattleFacilities.pdf>.
- *Livestock Handling Systems, Cattle Corrals, Stockyards and Races*. Temple Grandin.
<http://www.grandin.com/design/design.html>
- *Safe Cattle Handling; Good Practice Guidelines*. New Zealand Government. 2014.
<https://www.zeroharmfarm.com/saferfarms/safe-cattle-handling.pdf>.
- *Code of Practice on Safety and Health in Agriculture*. International Labour Organization.
https://www.ilo.org/wcmsp5/groups/public/@dgreports/@dcomm/@publ/documents/publication/wcms_159457.pdf

S2: Step Two - Define Actions for Addressing Hazards and Risks

The next step is to define specific actions to execute the procedures and best practices identified in S2: Step One, and when you want the actions to take place. The Hazard Risk Score for each task, calculated in S2: Step One, could help you prioritize the action plan.

Appendix H contains a worksheet you can use to record the actions you have decided to take for either eliminating or substituting the hazards or reducing the risks.

S2: Step Three - Eliminate or Substitute Hazards

Step Three of developing an action plan comprises the implementation of the actions identified in S2: Step Two to eliminate or substitute the hazards.

S2: Step Four - Develop Safety Policies for Reducing Risks

Step Four of developing an action plan consists of developing a safety policy document for each task related to working cattle. These documents should reflect the engineering and/or administrative controls and PPE recommendations described in S2: Step One of the action plan.

Appendix I contains a template you can use when defining your safety policies for each task.

STAGE THREE (S3): PREPARE

Once you have developed your action plan, you are ready for the next stage of implementing your ranch safety program: preparing you and your workers for reducing exposure to hazards and risks associated with working cattle on your operation. Your safety program can be as simple or as comprehensive as you feel is appropriate for your operation. Regardless of how detailed your safety program becomes, it should consist of the following:

- Written safety policies outlining best practices for protecting the workers for each task associated with working cattle
- Written ranch safety policy statement easily accessible to all employees
- An emergency action plan
- Formal training on safety awareness for workers

You most likely have developed the written safety policies for each task related to working your cattle as part of your action plan. The key to an effective ranch safety program now is to make sure everyone working with your cattle understands and implements the policies to the best of their abilities. The following sections provide information on developing a written ranch safety policy statement, an emergency action plan and a safety training program to help you create and implement the policies, procedures and trainings that best fit your ranching operation.

Written Ranch Safety Policy Statement

Your ranch's safety policy statement, consisting of statements of goals, objectives, and operational procedures, should be the foundation of your safety program. Safety policies describe the "who-what-when-where-why" of your operation's focus on safety. The policy statement should:

- Be created, written and approved by the highest-ranking owner/manager at the operation
- Be shared with all workers on the ranch
- State the overall safety program goals
- Include the most important safety and health procedures that apply to all workers, family members, managers and owners
- Identify who is responsible for various parts of the safety program.

Other guidelines for developing a written safety policy statement include:

- Having accountability procedures for complying with the safety program
- Providing the program in every language that is spoken at the farm or ranch
- Involving your employees in the development and implementation of the safety program
- Including emergency response instructions in the statement
- Requiring owners and managers to be CPR and first aid certified

In addition, consider a record-keeping system for reporting safety issues. Businesses with more than 10 employees (in the last 12 months) and those not classified as a partially exempt industry must record work-related injuries and illnesses using the OSHA 300, 300A and 301 forms. Additional information on recording and reporting work-related injuries and fatalities can be found by visiting the OSHA website at www.osha.gov/recordkeeping.

Being safe is everyone's responsibility. However, a culture of safety starts at the top of the organization. All employees, including owners and managers, should be required to follow the safety policies and procedures. Owners and managers abiding by the safety guidelines set a good example for all workers and significantly increases the likelihood of a successful safety program.

Appendix J is an example of a safety and health policy that can be implemented on your farm or ranch. Information can be changed or added to fit your unique needs. Other templates for a safety and health policy are listed in Resources.

Emergency Action Plan (EAP)

While you and/or your employees may know or intuitively think you/they know what to do in the event of an emergency when working cattle, it is always helpful to have a written emergency action plan (EAP) available at critical access points (such as in every vehicle and building) where you, your employees or others can find it easily and use to contact help. The purpose of an EAP is to facilitate and organize employer and employee actions during workplace emergencies quickly and efficiently. The operation should have an EAP that can be implemented for a variety of situations.

Well-developed emergency plans and proper employee training (such that employees understand their roles and responsibilities within the plan) will result in fewer and less severe employee injuries and less structural damage to the facility during emergencies. A poorly prepared plan likely will lead to a disorganized evacuation or emergency response, resulting in confusion, injury and property damage. The EAP should be posted at various locations throughout the operation and include, at a minimum, telephone numbers for the owner, veterinarian, equipment suppliers, and fire and police departments. Be sure to modify the EAP with your local emergency numbers.

See Appendix K for a sample EAP that you could use or adapt for your ranch. Another template for an EAP is listed in Resources.

Employee Training

Employee training for working your cattle is needed to ensure that employees can easily, comfortably and safely work cattle on your ranch. Both the timing and type of training are important. For example, repetition is frequently needed to master new skills and override unsafe habits, which is particularly relevant for working cattle since workers may have been using unsafe techniques for working cattle for a long time. Training should take place before new workers start work on your ranch (even if they have performed the same job at another ranch) for hazards and risks identified during seasonal tasks and for workers who are in need of retraining, as well as to meet legal and insurance obligations.

Effective Training

Effective training includes thorough descriptions of the safe cattle working procedures to be followed, methods for evaluating the safety procedures and the necessary tools for implementing the safety procedures. Your training program should consist of training on a regular basis to keep safe and healthy work practices relevant to workers. You also can consider general biannual trainings and monthly safety talks for seasonally relevant issues.

In addition, effective training needs to match the personality characteristics of your ranch employees. Ranch workers tend to be self-directed and goal- and problem-solving oriented, want to use personal experience, and expect relevant and practical training. They also typically are motivated by intrinsic and extrinsic factors. Extrinsic motivation occurs when people are motivated to perform a behavior or engage in an activity to earn a reward or avoid punishment. Intrinsic motivation involves engaging in a behavior because it is personally rewarding.

Near misses are a good topic to cover. This is a good proactive approach to help reduce injuries and incidents. Make sure the training is directed at learning and understanding rather than alienating the people involved in the near miss.

Training Key Components

The following four key components should be included in your safety training:

- How to identify hazards
- Proper safe work practices and how to implement them
- When and how to use personal protection equipment (PPE)
- Basic first aid, CPR and emergency training

Training Tips

Implementing training programs can be overwhelming, so the following tips may be helpful when developing and conducting your ranch's safety training:

- Training material
 - Be specific.
 - Give examples.
 - Ensure the trainer knows the job well and is prepared ahead of time for training.
- Training session
 - Schedule regular practice, interactive components, and hands-on activities.
 - Explain the purpose of the training.
 - Mix it up.
 - Keep it short.
- Encourage employee involvement.
- Treat the worker as an equal or a friend.
- Demonstrate the process step by step.
- Instruct the worker to perform the job one step at a time. This process can be repeated.
- Monitor performance and evaluate the training.
- Document all trainings, including attendance.

Ranch Safety Program *Example*

Training Materials -

1. Safety policies outlining best practices for each task
2. Materials for demonstrating best practices
3. Emergency procedures materials

New Employee Training -

Training for all new employees, regardless of their experience

Seasonal Refreshers -

Refresher training for all employees at the beginning of each season for seasonal tasks such working calves in the spring

Annual Overall Safety Program Review -

Review of Ranch Safety Policy Statement and Emergency Action Plan annually with all employees

Tailgate Training

Tailgate training is an effective, informal way to communicate safety information to the workers. It is usually conducted in 15- to 20-minute time periods on a specific safety topic among a small group of workers. The managers are the ones giving the information. Tailgate sessions usually happen in the morning before work has started and during the beginning of the week. It is usually conducted every week and directly related to the work assigned for that time frame.

STAGE FOUR (S4): MONITOR

A successful ranch safety program does not end with employee training. For your safety program to remain relevant and current, the different aspects of it should be reviewed and, if necessary, revised on an ongoing basis. This includes monitoring:

- Your ranch's hazards and risks.
- The action plan you have implemented to eliminate or reduce hazards and risks related to working cattle on your ranch.
- Your ranch safety policy statement and emergency action plan.
- The effectiveness of the safety training implemented on your operation.

Hazards and Risks

The facilities and equipment used on your ranch may be redesigned or changed over time or there may be new products that would work better on your operation. In addition, the temperament of your cattle may evolve due to changing genetics or the frequency of when they are handled. Lastly, your management practices may change. As a result of the dynamic nature of managing your cattle, you should re-evaluate on a regular basis the hazards and risks associated with working your cattle and the persons at risk. The monitoring frequency will depend on many factors including the size of your operation (number of cattle and employees), how often your facilities and equipment are modified, the frequency of changing management practices and employee turnover. It is recommended that you specify how often you review and revise, if necessary, the identification of hazards and risks related to working cattle on your ranch in your written safety policy statement.

Action Plan

As a result of the hazards and risks associated with working cattle changing over time, your action plan also may need to be reviewed and revised. This effort would include reviewing and revising, if necessary, the procedures you have used to eliminate or reduce hazards, and the safety best practices you have developed to reduce your workers' exposure to hazards and risks related to working cattle. Performing an assessment of your ranch's action plan on an ongoing basis will provide you with an opportunity to make comparisons, observe trends and revise your safety procedures and policies in an effort to continually improve your ranch's safety program.

There are assessment resources available to help you create an approach to evaluating your action plan. One resource is the BQA Cow-Calf Assessment (listed in Resources), which is an online educational tool that allows for assessing and benchmarking key indicators of animal care and well-being as well as operational conditions. The Cow-Calf Assessment focuses on three main areas - Animals, Records and Best Management Practices (BMP), and Facilities and Equipment. The Cow-Calf Assessment consists of multiple assessment points grouped into three "tiers" that are most easily defined by management level and effort. Repeating the assessment on a regular basis can help an operation identify trends and take appropriate management action as necessary.

The BQA Cow-Calf Assessment guide contains references to many types of records, including documentation of BMPs, also known as standard operating procedures (SOPs) or protocols. A set of customizable, fill-in-the-blank, sample/template forms is provided.

Once the action plan is reviewed and revised, your written safety policies should also be reviewed and revised as deemed necessary.

Ranch Safety Policy Statement and Emergency Action Plan (EAP)

Your ranch safety policy statement and emergency action plan (EAP) will contain information that may change over time. For the safety policy statement to remain relevant and the EAP to be applicable during an emergency, they should be reviewed and revised, if necessary, at least annually, if not twice a year.

Training

The only way to determine if safety training has been effective in correcting hazards and reducing risks is to evaluate the training program. There are several approaches that could be used to evaluate the effectiveness of your safety training program, including:

- Measuring how your employees reacted to the training, including how relevant and useful the training was to their work tasks and improving their safety.
- Assessing what knowledge and skills your employees learned from the training. This might include pre- and post-training tests to determine if the workers gained the desired knowledge.
- Evaluating how the training impacted your employees' actions and attitude when working cattle. This would involve observing your employees after the training has been conducted. You can ask questions and have them demonstrate their newly learned skills and capabilities while you are watching to make sure the job is done correctly and in the safest manner possible.
- Measuring the tangible results of the training, such as reduced number of injuries from working cattle.

These approaches are based on the Kirkpatrick Model, and resources for applying this model are listed in the Resource section. You do not need to measure everything. You could use only one or several of these approaches, depending on what best fits your operation.

Resources

- Information about performance monitoring and measurement is available in the *ILO Guidelines on occupational safety and health management systems*, ILO-OSH, 2001, section 3.11.
https://www.ilo.org/wcmsp5/groups/public/@dgreports/@dcomm/@publ/documents/publication/wcms_107727.pdf
- *Beef Quality Assurance Assessor's Guide to a Beef Quality Assurance Cow-Calf Assessment*.
https://www.bqa.org/Media/BQA/Docs/assessors_guide_cow-calf.pdf
- *Farm Safety Self-Assessment*. NSW Government.
https://www.safework.nsw.gov.au/__data/assets/pdf_file/0007/55852/Farm-safety-self-assessment-8765.pdf
- *Kirkpatrick Evaluation Method*.
 - <https://www.businessballs.com/training-assessment-and-quality-assurance/kirkpatrick-evaluation-method/>
 - <https://www.kirkpatrickpartners.com/Our-Philosophy/The-Kirkpatrick-Model>
 - <https://www.linkedin.com/business/learning/blog/learning-and-development/the-best-way-to-use-the-kirkpatrick-model-the-most-common-way#:~:text=%E2%80%9CStart%20at%20level%20four%20and,his%20course%2C%20Measuring%20Learning%20Effectiveness>

CONCLUSION

Ranching is filled with practices steeped in tradition, and these traditions often continue because “that’s the way things have always been done!” In addition, there is the nostalgic image of ranching, and working cattle is a prime example of that. However, there also are many hazards associated with working bulls, cows and calves that may result in injuries and deaths. As a ranch owner/operator, you want to preserve the heritage of the ranch while protecting your family and employees. Implementing a ranch safety program in the four stages outlined in this module will help you do that. While the recommendations may seem like tedious and unnecessary work, establishing a ranch safety program will decrease ranch-related injuries and deaths, decrease your liability, and increase your peace of mind.

Ranch Safety Program *Example*

NO Safety Program

1. **NO** identification of hazards and risks
2. **NO** elimination of hazards or reduction of risks
3. **NO** written safety policies, safety policy statement or emergency action plan

Potential Impact

- Increased risk of worker exposure to hazards
- Increased chance of severe injuries/illnesses
- Increased liability

Safety Program in Place

1. Hazards and risks are identified
2. Hazards are eliminated or risks are reduced
3. Written safety policies, safety policy statement and emergency action plan

Potential Impact

- Decreased risk of worker exposure to hazards
- Decreased chance of severe injuries/illnesses
- Decreased liability

APPENDICES - RESOURCES AND TOOLS

Appendix A - Example

Stage One (S1): Identify and Assess

Stage One (S1) consists of three steps:

1. **S1: Step One:** Define the tasks associated with working cattle.
2. **S1: Step Two:** For each task, identify:
 - a. Hazards
 - b. Sources of hazards
 - c. Workers impacted
 - d. Injuries/illnesses
3. **S1: Step Three:** For each task, assess the risk by calculating a Hazard Risk Score. This score can be used to help develop and implement the action plan.

S1: Step One involves defining the tasks related to working cattle on the ranch. For this example, three tasks associated with working cattle were defined: (1) working cattle in a cattle chute (or also called alley or run); (2) working cattle in a squeeze chute; and (3) restraining/working calves that are at their mothers' sides.

S1: Step Two involves identifying the hazard(s) associated with each of the three tasks, the sources of the hazards, which ranch workers would be impacted in the event the hazards were to occur, and the injuries or illnesses that would occur in the event of the hazard.

S1: Step Three scores the risk associated with the hazards. This Hazard Risk Score can help prioritize the order in which the various hazards are eliminated or substituted, and the risks associated with the hazards are reduced.

The following outlines the steps used for identifying the hazards and assessing the risks for this example. This process could be done for any set of tasks that takes place on any operation related to working cattle.

Stage One (S1): Steps for identifying hazards and assessing risks:

(see Table 2 for descriptions of the scores and Table 3 for illustrations of each step)

Table 2. Descriptions for Hazard Likelihood Score and Consequence Outcome Score

Score	Description
1	Rare - happens rarely
2	Unlikely - possible, but it is not expected to happen
3	Possible - could be expected to occur once a year
4	Likely - most likely will occur, but not persistently
5	Certain - occurs regularly

Steps	Example (Illustrated in Table 3)
<p>S1: Step One - Identify the tasks</p>	<p>Three tasks are identified:</p> <ul style="list-style-type: none"> • “Working cattle in a cattle chute (also called alley or run)” • “Working cattle in a squeeze chute” • “Restraining/working calves that are on their mothers’ sides”
<p>S1: Step Two - Identify the potential hazards and their sources for each task</p>	<ul style="list-style-type: none"> • One hazard and two sources are identified for “Working cattle in a cattle chute” and “Working cattle in a squeeze chute” each • Three hazards and three sources were identified for “Restraining/working calves”
<p>S1: Step Two (continued) - For each task, identify the workers potentially impacted and possible injuries/illnesses (referred to as consequences) that might occur if they were to be injured or become ill in the event of the hazard(s) occurring</p>	<ul style="list-style-type: none"> • For the task of “Working cattle in a cattle chute”, the same worker role - a cattle chute handler- would be impacted if the hazard related to that task was to occur. • In the event that this hazard was to occur, bodily injury, possibly to the face, head, torso or limbs, is expected to occur
<p>S1: Step Three - For each task, score the likelihood the hazard is to occur when the task is taking place on a scale of 1 to 5 (see scale in Table 1); this is called the Hazard Likelihood Score</p>	<ul style="list-style-type: none"> • For the task of “Working cattle in a cattle chute,” the likelihood that an animal becomes frightened is “Possible” (Hazard Likelihood Score of 3) • Despite the fact that three hazards are identified for the task “Restraining/working calves.” the hazards would most likely result in the same “injury/illness” outcome; therefore, there is only one Hazard Likelihood Score assigned for this particular task; the score is “Possible” (Hazard Likelihood Score of 3)
<p>S1: Step Three (continued) - For each task and injury/illness (consequence) outcome, score the likelihood that the worker would experience the outcome, on a scale of 1 to 5 (see scale in Table 1); this score is called the Consequence Outcome Score</p>	<ul style="list-style-type: none"> • The likelihood that a worker would suffer a minor injury when working cattle in a cattle chute is “Likely” (Injury Outcome Score of 4) • The likelihood that a worker would suffer from a temporary disability when cattle in a squeeze chute is “Possible” (Consequence Outcome Score of 3)
<p>S1: Step Three (continued) - For each task, calculate the Severity Score by summing the Consequence Outcome Scores for each injury outcome</p>	<p>For “Working cattle in a cattle chute,” the Severity Score is calculated by adding the individual Consequence Outcome Scores for Minor Injury (4), Temporary Disability (3), and Death or Permanent Disability (1), resulting in a Severity Score of 8</p>
<p>S1: Step Three (continued) - For each task, calculate the Hazard Risk Score by multiplying the Hazard Likelihood Score by the Severity Score</p>	<p>For “Working cattle in a cattle chute,” the Hazard Risk Score is calculated by multiplying the Hazard Likelihood Score (3) by the Severity Score (8), resulting in a Hazard Risk Score of 24</p>

Table 3. Example: "Working Cattle and Related Facilities and Equipment" Hazards and Risks

S1: Step Two				S1: Step Three						
Identify				How likely would the worker experience the outcome if the hazard was to occur? (Consequence Outcome Score)						
S1: Step One	Source(s) of Hazard(s)	Hazard(s)	Workers Impacted	Injuries/Illness	How likely is the hazard to occur? (Hazard Likelihood Score)	Minor Injury (first aid) /Illness	Temporary disability/ Illness	Death or permanent disability/ Illness	Severity Score	Hazard Risk Score
	Task:	Working cattle in cattle chute								
	• Vision: Unexpected movement to side of or behind animal • Noise: High pitched, abrupt or loud noises	Animal becomes frightened, and as a result, tries to escape from the chute, rear up, head butt, charge or kick	Cattle chute handler	Bodily injury, possibly to face, head, torso or limb	3	4	3	1	8	24
	Task:	Working cattle in squeeze chute								
	• Temperament/disposition/sex (bulls): Isolation or constraint of highly temperament cattle or bulls • Noise: High pitched, abrupt or loud noises	Animal may become agitated, aggressive or frightened, and as a result, try to escape the squeeze chute, swing its head, head butt, or attack the handlers	Squeeze chute handler	Bodily injury, particularly to arms, but also possibly to face, head or torso	5	5	3	2	10	50
	Task:	Restraining/working calves that are at their mothers' sides								
	• Temperament/disposition of cow: Maternal instinct • Calf: Physical size • Location of restraining/working calf	• Mother cows with strong maternal instincts may try to charge or attack the handler • Large calves may resist • Location without adequate protection may increase the chance of injury	Calf handler	Bodily injury, possibly to face, head, torso or limb	3	4	2	1	7	21

Stage Two (S2): Prevent

Stage Two (S2) consists of developing an action plan to help prevent worker injury and illness on your ranch. Once the tasks and their hazards and associated risks have been identified in Stage One (S1), an action plan can be developed and implemented for eliminating or substituting the hazards, and/or reducing the risks associated with the hazards. The four steps for developing and implementing the action plan are:

1. **S2: Step One** - For each task, identify or develop:
 - a. Procedures for eliminating or substituting the hazards
 - b. Best practices for reducing exposure to the hazards and risks through:
 - i. Engineering controls
 - ii. Administrative controls
 - iii. Personal Protection Equipment (PPE)
2. **S2: Step Two** - Explicitly define the actions to be taken to implement the procedures and best practices identified in Step One and when the actions will take place. The Hazard Risk Score, calculated in Stage One, can be used to help prioritize the action plan.
3. **S2: Step Three** - Implement the best practices for eliminating or substituting hazards and/or the engineering controls.
4. **S2: Step Four** - Develop ranch policies based on the best practices identified in Step One for working cattle on your operation.

Table 4 illustrates **S2: Step One** of developing an action plan for the tasks and hazards identified in Table 3. The following steps were followed to identify or develop procedures and best practices for eliminating hazards or reducing risks for this example.

Stage Two (S2): Step One: Identifying or developing procedures and best practices for eliminating hazards or reducing risks associated with working cattle:

(see Table 4 for illustrations of each step)

S2: Step One	Example (Illustrated in Table 4)
1. Review Best Practices for “Working Facilities and Equipment” for ways to eliminate or substitute the hazards for each task	A single-file cattle chute with solid walls and at least 20 feet long was identified to eliminate the hazards or reduce the risks associated with working cattle in a cattle chute
2. Review Best Practices for “Cattle Senses and Temperament” and “Cattle Working” for engineering controls (worker protection) to reduce the risk for each task	<ul style="list-style-type: none"> • An emergency escape plan or route was identified as an engineering control for protecting the workers when working cattle in a cattle chute • Using horn guards on a squeeze chute was identified as an engineering control when working horned cattle
3. Review Best Practices for “Cattle Senses and Temperament” and “Cattle Working” for administrative controls (task procedures) to reduce the risks for each task	<ul style="list-style-type: none"> • Various procedures for working the cattle in cattle chutes were identified to help protect workers and reduce risks • Using proper techniques when lifting calves was identified to help protect workers and reduce risks
4. Review Best Practices for “Personal Protective Equipment (PPE)” for PPE that could be used to reduce the risks	Protective clothing and footwear were identified to help protect workers and reduce risks for all three tasks

Table 4. Example: Procedures and Best Practices for Addressing Hazards and Risks Associated with Working Cattle

Hazard Risk Score	Task	Hazards/Risks	Procedures and Best Practices for Addressing Hazards/Risks			
			Eliminate or Substitute	Engineering Controls (Worker Protection)	Administrative Controls (Task Procedures)	Personal Protection Equipment (PPE)
50	Squeeze Chute	Animal may become agitated, aggressive or frightened, and as a result, may try to escape the squeeze chute, sling its head, head butt or attack handlers	<ul style="list-style-type: none"> Use squeeze chutes with key safety features such as secure head and side latches, a gate at back, non-slip flooring, and integrated hinges at major pivot points Use a design and size that best fits the ranch's working needs (considerations include number and size of cattle), keeping in mind the safety pros and cons of each design type 	<ul style="list-style-type: none"> Keep the squeeze chute work area clean and free of trip hazards Place rubber stops on the squeeze chute to reduce noise If the chute is a hydraulic chute, position the hydraulic pump and motor away from the squeeze chute to reduce the adverse impact of loud noises on the cattle Use horn guards if working horned cattle in the squeeze chute Inspect the squeeze chute prior to every use to ensure it works correctly 	<ul style="list-style-type: none"> All squeeze chute handlers should be trained prior to every use Avoid inserting head, hands, arms or legs into the squeeze chute when an animal is in the chute Do not stand directly in front of or behind a squeeze chute when an animal is in the chute Handle cattle as quietly as possible Consider acclimating the cattle to the squeeze chute prior to the actual work session 	<ul style="list-style-type: none"> Wear attire and other protective clothing that will help reduce injury. These types of clothing include a strong pair of trousers or jeans, long-sleeve shirts, gloves and coveralls Wear proper footwear such as steel-toed or leather boots

Hazard Risk Score	Task	Hazards/Risks	Procedures and Best Practices for Addressing Hazards/Risks			
			Eliminate or Substitute	Engineering Controls (Worker Protection)	Administrative Controls (Task Procedures)	Personal Protection Equipment (PPE)
24	Cattle Chute	Animal may become frightened, and as a result, may try to escape, rear up, head butt, charge or kick	<ul style="list-style-type: none"> • Use a single-file cattle chute with solid walls high enough to discourage cattle trying to escape and at least 20 feet long • The solid walls help reduce the chance of cattle trying to escape and minimize what cattle can see to their sides • A single-file chute helps minimize the chance of cattle charging • Twenty-foot chutes help animals see others in front of them 	Have an emergency escape plan or route	<ul style="list-style-type: none"> • Ensure that workers treat animals in a humane manner • Handle cattle as quietly as possible • Avoid loud noises • Use cattle's flight zone effectively to reduce cattle stress • Use a calm and confident voice to alert the cattle to your presence 	<ul style="list-style-type: none"> • Wear attire and other protective clothing that will help reduce injury. These types of clothing include a strong pair of trousers or jeans, long-sleeve shirts, gloves and coveralls • Wear proper footwear such as steel-toed or leather boots

		Procedures and Best Practices for Addressing Hazards/Risks				
Hazard Risk Score	Task	Hazards/Risks	Eliminate or Substitute	Engineering Controls (Worker Protection)	Administrative Controls (Task Procedures)	Personal Protection Equipment (PPE)
21	Calves	<ul style="list-style-type: none"> • Mother cows with strong maternal instincts may try to charge or attack the handler • Large calves may resist constraint or try to escape • Location without adequate protection may increase the chance of injury 		<ul style="list-style-type: none"> • Try to avoid working/restraining calves whose mothers have strong maternal instincts when you are unable to isolate the calves from the mothers • When possible, use a calf table, particularly for large calves • Try to avoid working/restraining calves in open pastures or pens 	<ul style="list-style-type: none"> • Be aware of and keep your distance from aggressive mother cows • Keep calves quiet by holding their mouths shut • Use proper lifting techniques (use your legs and keep your back straight) when lifting calves and only lift the calf if absolutely necessary • Keep the calf between you and its mother. If possible, try to keep a fence or vehicle between you and the cow 	<ul style="list-style-type: none"> • Wear attire and other protective clothing that will help reduce injury. These types of clothing include a strong pair of trousers or jeans, long-sleeve shirts, gloves and coveralls • Wear proper footwear such as steel-toed or leather boots

S2: Step Two of developing an action plan involves explicitly defining the actions to be taken to eliminate or substitute the hazards or reduce the risks associated with working cattle and when the actions will take place. For example, the best practices identified in Step One could be enacted on as shown in Table 5.

Table 5. Example: Actions for Eliminating Hazards and/or Reducing Risks Associated with Working Cattle

Action Plan for Eliminating or Substituting Hazards or Implementing Engineering Controls				
Priority	Hazard Risk Score	Task	Action	When
1	50	Working cattle in squeeze chute	Install non-slip flooring, rubber stops and horn guards on the squeeze chute	Within 6 months
5	24	Working cattle in cattle chute	Build solid 6-foot high walls in the cattle chute	Within 12 months

Action Plan for Reducing Risk Through Engineering and/or Administration Controls and PPE				
Priority	Hazard Risk Score	Task	Action	When
2	50	Working cattle in squeeze chute	Develop policy document reflecting best practices	Within 6 months
3	24	Working cattle in cattle chute	Develop policy document reflecting best practices	Within 9 months
4	21	Restraining/working calves that are at their mothers' sides	Develop policy document reflecting best practices	Within 9 months

S2: Step Three of developing an action plan comprises the implementation of the actions identified in Step Two of the action plan. In this example, the actions of:

1. Installing non-slip flooring, rubber stops and horn guards on the squeeze chute would be done within the targeted six months; and
2. Building solid walls in the cattle chute high enough to discourage cattle from trying to escape would be completed within a year.

S2: Step Four of developing an action plan consists of developing a policy document for each task. These documents should reflect the engineering and/or administrative controls and PPE recommendations described in Step One of the action plan. For this example, Table 6 illustrates the policy document that could be developed for working cattle in a squeeze chute.

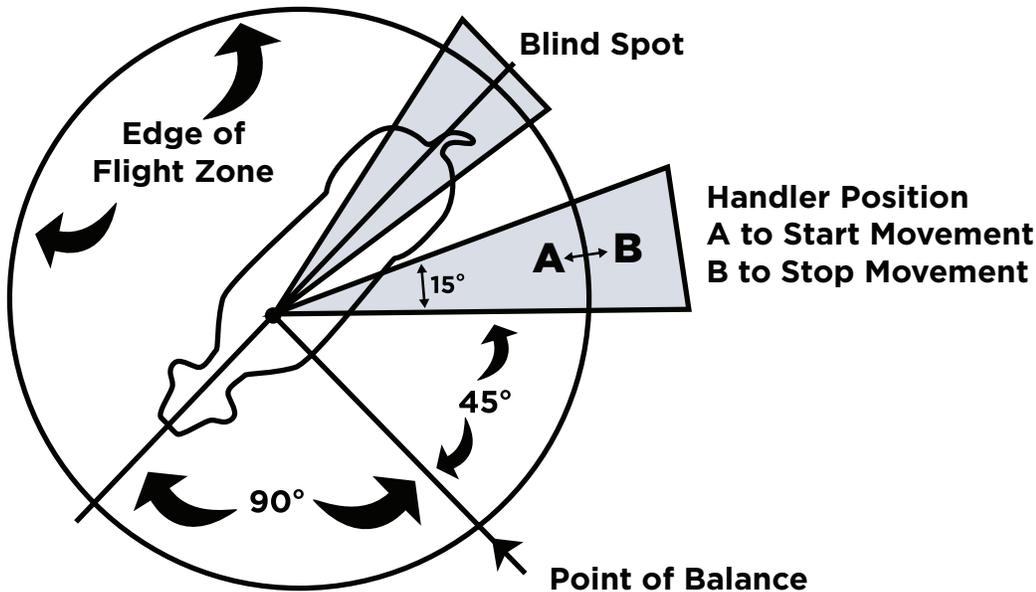
Table 6. Example: Safety Policy Document for Working Cattle in Squeeze Chutes

Policies for Working Cattle in Squeeze Chutes
<p>Prior to working cattle in squeeze chutes:</p> <ul style="list-style-type: none">• Clean the squeeze chute work area and ensure the area is free of trip hazards• Inspect the squeeze chute to ensure it works correctly• Verify that chute handlers know how to operate the squeeze chute; if not, train the workers• Consider acclimating the cattle to the squeeze chute prior to the actual work session
<p>During work session:</p> <ul style="list-style-type: none">• Avoid inserting head, hands, arms or legs into the squeeze chute when an animal is in the chute• Do not stand directly in front of or behind a squeeze chute when an animal is in the chute• Treat all cattle in a humane way• Handle cattle as quietly as possible and avoid noises• Wear protective clothing and proper footwear

Appendix B - Hazard Sources and Implications

Cattle Senses	
Vision	
Factors/Traits	Implications on Cattle Behavior and Working
<ul style="list-style-type: none"> Cattle have panoramic vision in excess of 300 degrees, meaning that, without moving their head, they can see in all directions, except directly behind them. 	<ul style="list-style-type: none"> Cattle cannot decipher distances when just seeing with one eye and cannot see behind them at all. If cattle sense movement to the side or rear of them, they will get scared. The “flight zone” is an animal’s safety zone or personal space, and indicates how close you can get to an animal before it starts moving away from you (Figure 1). Cattle will move away from you when you enter their flight zone and will stop moving when you exit their flight zone.
<ul style="list-style-type: none"> Cattle have poor depth perception, especially when they are moving with their heads up, limited vertical vision, and cannot focus quickly. 	<ul style="list-style-type: none"> Cattle may balk at stark contrasts in lighting. A shadow on the ground may appear to the animal as a deep hole. Cattle must lower its head to focus on the ground. Cattle are sensitive to harsh contrasts between light and dark colors. Cattle have a tendency to move toward the light. Unfamiliar objects and shadows on the ground are the primary reasons for cattle balking and delaying the animals behind them.

Figure 3. Cattle Flight Zones



Source: Beef Quality Assurance National Manual

Cattle Senses (continued)	
Hearing	
Factors/Traits	Implications on Cattle Behavior and Working
<ul style="list-style-type: none"> • Cattle can hear both lower-volume and higher frequency sounds better than people. • Cattle are less able than humans to pinpoint the exact location of sound sources. • Generally, cattle rely to a greater extent on hearing only when they have severe sight problems. • Cattle point their ears toward things that concern them. 	<ul style="list-style-type: none"> • High-pitched, abrupt, loud noises close to cattle are very stressful. • If humans yell at cattle, the cattle can become fearful and may react by running away from the noise, charging or kicking. • Cattle may suddenly swing around to investigate a noise. • Cattle’s “ear radar” can provide an indication of stimuli that have attracted the animal’s attention. Calm cattle can help you locate distractions in a cattle working facility that can cause balking.
Smell	
Factors/Traits	Implications on Cattle Behavior and Working
<ul style="list-style-type: none"> • Cattle use their sense of smell to identify other cattle, for heat detection and for breeding activities. 	<ul style="list-style-type: none"> • When an animal is frightened, it typically relies less on its sense of smell and more on vision and hearing. Certain smells may cause wariness or fear if cattle associate the smells with something bad.
Feel/Touch	
Factors/Traits	Implications on Cattle Behavior and Working
<ul style="list-style-type: none"> • Cattle also interpret their environment through touch. 	<ul style="list-style-type: none"> • Cattle can make specific touch associations. Pats may be misinterpreted as hitting. Light touches may tickle or scare an animal.

Cattle Instinct/Temperament/Genetics	
Herd Instinct	
Factors/Traits	Implications on Cattle Behavior and Working
<ul style="list-style-type: none"> • Cattle have a strong herd instinct. When other cattle are seen, they will seek their company. • Cattle tend to move in groups and follow the leader. • Cattle are comforted by the feel of other animals around them, especially when within three feet. 	<ul style="list-style-type: none"> • Individual animals become anxious in situations that lead to isolation from the herd. An agitated or excited lone animal can be very dangerous and may charge at people or injure itself trying to rejoin the herd. • Isolated animals are more likely to seek escape routes and display nervous behavior, leading to increased injury risk or performance losses. They will seek the company of other cattle and may run through fencing or people trying to rejoin the herd. • Highly temperamental cattle may attack handlers when isolated.
Temperament/Disposition	
Factors/Traits	Implications on Cattle Behavior and Working
<ul style="list-style-type: none"> • Temperament, also referred to as disposition, reflects the ease with which animals respond to working, treatment and routine management. 	<ul style="list-style-type: none"> • Animals with temperament problems are a safety risk to handlers, themselves and other animals in the herd. • Temperament affects working equipment requirements, operation liability exposure, beef quality assurance and performance. • Highly excitable cattle are more likely to exit chutes faster than less excitable cattle. • Highly temperamental cattle may attack handlers when isolated.
<ul style="list-style-type: none"> • The Beef Improvement Federation has developed a subjective pen or chute score that can be used to evaluate cattle temperament. 	<ul style="list-style-type: none"> • The score categorizes cattle into six classes: docile, restless, nervous, flighty, aggressive, and very aggressive.
<ul style="list-style-type: none"> • Bulls tend to be aggressive and unpredictable. 	<ul style="list-style-type: none"> • Aggressive bulls can be unpredictable and may have a tendency to charge or assault handlers.
Genetics	
Factors/Traits	Implications on Cattle Behavior and Working
<ul style="list-style-type: none"> • Genetic factors affect an animal's reaction to working. 	<ul style="list-style-type: none"> • Brahman and Brahman-cross cattle are more excitable and harder to handle than British and Continental breeds. • When Brahman or Brahman-cross cattle become excited, they are more difficult to block at fences than British and Continental breeds. • Highly excited Brahman cattle may lie down and become immobile if they are repeatedly prodded with an electric prod.

Cattle Instinct/Temperament/Genetics (continued)

Cattle Defense Mechanisms

Factors/Traits

- Cattle use several different methods to protect themselves when they become frightened, agitated or stressed. These methods include:
 - Fleeing
 - Kicking
 - Pawing and stomping
 - Head butting
 - Charging
 - Squeezing or pushing

Implications on Cattle Behavior and Working

- A spooked animal or a small calf can run into or over a person and cause severe injury.
- Mature cattle and calves have a powerful kick. Cows tend to kick forward and out to the side, whereas calves tend to kick straight back. Cows also tend to kick toward a side with pain.
- Cattle head movements such as head butts and slinging are especially dangerous with horned cattle, which can gore handlers or other cattle.
- Cattle restrained in squeeze chutes can still sling their heads, stomp and cause injury. Arm injuries occur frequently because workers get their arms trapped between the cattle and the chute.
- Cattle can squeeze or crush handlers or other animals between themselves and facilities. Standing behind a gate, even a latched one, can result in injury if cattle kick or run into the gate. A person standing between a gate and a fence or in the path of cattle can be crushed between the gate and the fence or between cattle and the fence. The weight of cattle can put a great deal of force on a person. Even an animal turning can press a person against a fence and cause injury.
- Cattle can also trample over or kick humans or step on handlers' feet when stressed or agitated.
- Another hazard is being pushed into sharp objects that may cause punctures.
- Removal from a familiar pasture or pen can cause animals to react unexpectedly. Shadows, yelling and contrasts in lighting can further excite animals and make their behavior unpredictable. Similar problems occur when animals are moved away from feed, separated from the herd or approached by an unfamiliar person.
- Overstressed cattle exhibit warning signs. For example, they may make loud noises and use their hooves to stomp and scrape the ground.

- Cattle exhibiting maternal instincts are usually more defensive and difficult to handle.

- Worker incidents and injuries occur frequently when mother cows get stressed or irritated.
- When the cows feel their calf is threatened, they get protective and aggressive and may charge or head butt what is threatening them or their calves. The younger the calf is, the more dangerous the mother cow can be.
- When calves bellow, it can agitate the mother cow.

Previous Experience/Other	
Cattle Memory and Previous Experience	
Factors/Traits	Implications on Cattle Behavior and Working
<ul style="list-style-type: none"> • Cattle can store fear memories long-term. 	<ul style="list-style-type: none"> • These fear memories may be specific and associated with a certain person or object such as working equipment.
<ul style="list-style-type: none"> • An animal's stress reaction to a working procedure, such as transportation or restraint, depends on three important factors: genetics, individual differences and previous experiences. 	<ul style="list-style-type: none"> • Facility design can have a strong influence on previous experiences. Poor design will increase stress.
Injury/Illness/Disease	
Factors/Traits	Implications on Cattle Behavior and Working
<ul style="list-style-type: none"> • Injury, illness and disease can alter the disposition of an animal, such as causing the animal to become more aggressive or exhibit abnormal behavior. • The animal also may be contagious if ill or has a disease. 	<ul style="list-style-type: none"> • The change in the behavior of the animal and its possible contagiousness may increase the hazard of injury and/or illness to ranch workers.
Extreme Weather Conditions	
Factors/Traits	Implications on Cattle Behavior and Working
<ul style="list-style-type: none"> • Extreme temperatures such as cold or heat can create additional stress on cattle. 	<ul style="list-style-type: none"> • The increased stress may cause the cattle to behave abnormally.

Appendix C – Stage One (S1): Identifying Hazards and Assessing Risks

This appendix outlines the three steps for Stage One (S1) to identify the hazards and assess the risks. This process could be done for any set of tasks that takes place on any operation related to working cattle.

S1: Step One - Define the Tasks

Define the tasks related to working cattle on the ranch that have potential to cause worker injury or illness.

S1: Step Two - Identify the Hazards, Sources, At-Risk Workers and Potential Injuries/Illnesses

Identify:

1. The hazards associated with each task pertaining to working cattle on your operation
2. The sources of the hazards
3. The workers who might be harmed or become ill if the hazards were to occur. This includes hazards associated with the facilities and equipment involved with working the cattle
4. The consequences of injuries and/or illnesses that could possibly occur if the hazards were to occur

S1: Step Three - Assess the Risks

Assess the safety and health risks that arise with working your cattle and the related working facilities and equipment on your operation as follows:

1. Assign a **Hazard Likelihood Score** for each task by scoring the likelihood the hazard is to occur when the task is taking place. The scores are shown in Table 2.
2. Assign a **Consequence Outcome Score** for each task and injury/illness outcome. There are three possible injury/illness outcomes: minor injury/illness, temporary disability/illness, and death or permanent disability/illness. The scores are shown in Table 2.
3. Calculate the **Severity Score** for each task by summing the three Injury Outcome Scores.
4. Calculate the **Hazard Risk Score** by multiplying the Hazard Likelihood Score by the Severity Score.

Stage One (S1): Steps for identifying hazards and assessing risks:

(See Table 2 for descriptions of the scores and Table 3 for a worksheet that could be used for this step)

Steps	Comments/Score Calculations
<p>S1: Step One - Identify the tasks</p>	
<p>S1: Step Two</p> <ul style="list-style-type: none"> Identify the potential hazards and their sources for each task For each task, identify the workers potentially impacted and possible injuries/illnesses (referred to as consequences) that might occur if they are injured or become ill in the event of the hazard(s) occurring 	<ul style="list-style-type: none"> You can identify one or more hazard for each task You can identify one or more source for each hazard You can identify one or more types of workers that might be impacted by the hazards identified for each task
<p>S1: Step Three</p> <ul style="list-style-type: none"> For each task, score the likelihood the hazard is to occur when the task is taking place on a scale of 1 to 5 (see scale in Table 2). This is called the Hazard Likelihood Score 	<ul style="list-style-type: none"> If more than one hazard is identified for each task, think about whether the hazards would most likely result in the same or different injury/illness outcome(s) (consequence(s)). If there most likely will be the same consequence, you only need to assign one Hazard Likelihood Score
<ul style="list-style-type: none"> For each task and injury / illness (consequence) outcome, score the likelihood that the worker would experience the outcome on a scale of 1 to 5 (see scale in Table 2); this score is called the Consequence Outcome Score 	<ul style="list-style-type: none"> Assign a Consequence Outcome Score for the likelihood a worker would experience a minor injury (first aid) or illness Assign a Consequence Outcome Score for the likelihood a worker would experience a temporary disability or illness Assign a Consequence Outcome Score for the likelihood a worker would experience death or a permanent disability or illness
<ul style="list-style-type: none"> For each task, calculate the Severity Score by summing the Consequence Outcome Scores for each injury/illness outcome 	<p>Calculation of Severity Score:</p> <ul style="list-style-type: none"> Minor injury (first aid) or illness Consequence Outcome Score PLUS Temporary disability or illness Consequence Outcome Score PLUS Death or permanent disability or illness Consequence Outcome Score
<ul style="list-style-type: none"> For each task, calculate the Hazard Risk Score by multiplying the Hazard Likelihood Score by the Severity Score 	<p>Calculation of Hazard Risk Score:</p> <ul style="list-style-type: none"> Hazard Likelihood Score MULTIPLIED BY Severity Score

Table 2. Descriptions for Hazard Likelihood Score and Consequence Outcome Score

Score	Description
1	Rare - happens rarely
2	Unlikely - possible, but it is not expected to happen
3	Possible - could be expected to occur once a year
4	Likely - most likely will occur, but not persistently
5	Certain - occurs regularly

The following page is a worksheet you could use when identifying the hazards and assessing the risks for each of the tasks related to working cattle on your operation.

Table 3. Worksheet for Identifying Hazards and Assessing Risks

Identify				How likely would the worker experience the outcome if the hazard was to occur? (Consequence Outcome Score)					
Source(s) of Hazard(s)	Hazard(s)	Workers Impacted	Injuries/ Illness	How likely is the hazard to occur? (Hazard Likelihood Score)	Minor injury (first aid) /Illness	Temporary disability/ Illness	Death or permanent disability/ Illness	Severity Score	Hazard Risk Score
Calculations =====>								Add individual Consequence Outcome Scores	Multiply Hazard Likelihood Score by Severity Score
Task:									
Task:									
Task:									
Task:									

Appendix D - Identifying Procedures and Best Practices for Addressing Hazards and Risks Worksheet

Hazard Risk Score	Task	Hazards/Risks	Procedures and Best Practices for Addressing Hazards/Risks			
			Eliminate or Substitute	Engineering Controls (Worker Protection)	Administrative Controls (Task Procedures)	Personal Protection Equipment (PPE)

Appendix E - Cattle Working Facilities and Equipment Safety Best Practices

Working Facilities and Equipment	
Topic	Best Practices
Pens and yards	<ul style="list-style-type: none"> • Ensure that the pens or yards are clear of debris. • Use a pen or yard surface management plan appropriate for your climate and the surface in your environment. • Provide sufficient lighting in the pens or yards. • Verify that there are no protruding nails and bolts. • Ensure that the pens or yards are designed efficiently. • Keep the fences and gates in good working condition, which includes no broken boards or gaps in the fences. • When working with Brahman or Brahman-cross cattle, use visually substantial fences built with planks or a wide-belly rail.
Working areas	<ul style="list-style-type: none"> • Use working areas with minimal or no shadows that might prevent cattle from entering into the chutes or working areas. Cattle tend to move from dark areas to light areas, providing the light is not glaring. A spotlight directed onto a ramp or other apparatus often will facilitate entry.
Working facilities	<ul style="list-style-type: none"> • Use working facilities such as loading ramps and working chutes with solid walls to prevent animals from seeing distractions outside the work area. This reduces stress for the cattle. • Paint working facilities a uniform color, because cattle are more likely to balk at a sudden change in color. • Use nonslip flooring in cattle working areas like squeeze chutes, loading ramps, scales and crowding pens. • If working cattle at night, use frosted lamps that do not glare in the animal's faces. Position these lights in the area where moving cattle, such as a trailer or barn. • Use a branding table, when possible, during branding to reduce accidents.
Gates and squeeze chutes	<ul style="list-style-type: none"> • Place rubber stops on gates and squeeze chutes to reduce noise.
Squeeze chutes	<ul style="list-style-type: none"> • Adjust hydraulic or manual restraining chutes to the appropriate size for the cattle to be handled. • Clean and maintain the chutes' working parts regularly to ensure the systems function properly and are safe for the cattle and handlers.
Cattle chutes or alleys	<ul style="list-style-type: none"> • Make single-file chutes at least 20 feet long or 30 to 50 feet long for larger facilities. Each animal should be able to see others ahead of it. • Use a curved single-file chute or working alley for moving cattle into a truck, trailer or squeeze chute. A curved working system is more efficient than a straight chute or alley because it prevents the cattle from seeing to the end of the chute until the animal is almost there. This type of system benefits cattle waiting in line for vaccinations or other procedures. A curved chute with an inside radius of 13 feet to 16 feet works well for working cattle.
Pneumatic-powered equipment	<ul style="list-style-type: none"> • Pipe exhausts from pneumatic-powered equipment away from the working area.
Hydraulic-powered equipment	<ul style="list-style-type: none"> • Position the hydraulic pump and motor away from the squeeze chute to reduce the adverse impact of loud noises on the cattle.

Working Facilities and Equipment (continued)	
Topic	Best Practices
Working tools	<ul style="list-style-type: none"> • Use non-electric driving aids such as flags, sorting sticks, streamers or plastic paddles to get the cattle's attention and direct them in the direction you want them to go. • Do not use electric prodders unless absolutely necessary. When cattle prods must be used, avoid contact with sensitive areas, including the eyes, rectum, genitalia and udder. • Avoid the use of AC-powered driving aids unless they are manufactured and labeled specifically for that purpose.
Housing facilities	<ul style="list-style-type: none"> • Ensure that mechanical and electrical devices are in top working condition and free of frayed wires. • Provide sufficient space for optimal comfort, socialization and environmental management for the cattle. • When fabricating housing, consider adequate ventilation, amount of space per animal, the potential need for bedding, the direction and force of wind, safe use of mechanical/electrical devices, waste removal/drainage, and the animals' continued access to food and water.
Loading/unloading	<ul style="list-style-type: none"> • Make sure the loading/unloading ramp is free from slip hazards, not too steep and in good working order. Unloading ramps should have 12 feet of straight chute/alley at the end of the slope for cattle to slow down after unloading.
Transportation	<ul style="list-style-type: none"> • Use slip-resistant flooring in the trailers and trucks. • Provide adequate ventilation and protection during transit.
Unloading	<ul style="list-style-type: none"> • Use a paddock or a stand-off area as an offloading area to reduce injuries to the cattle.

Appendix F – Cattle Behavior and Working Safety Best Practices

Cattle Senses and Temperament	
Topic	Best Practices
Hearing	<ul style="list-style-type: none"> • Handle cattle as quietly as possible. • Avoid loud noises when working cattle. Some noises cannot be avoided and noises can be used to move cattle, as long as they are neither loud nor abrupt. • Speak softly with a low tone of voice.
Vision	<ul style="list-style-type: none"> • Understand cattle's flight zones to reduce cattle stress and help reduce incidents. The size of the flight zone depends on different factors, including how acclimated the cattle are to their surroundings and to people. The flight zone can be determined by walking slowly up to the cattle and observing the point at which the cattle begin to move away from you. • Work on the edge of the flight zone to stop and start the movement of the cattle easily. • Use the animal's flight zones effectively. To move cattle forward, move toward the rear area, past their point of balance (shoulder). To stop or back up the cattle in a chute, move forward past their point of balance. • Use a calm and confident voice to alert the cattle to your presence.
Mother cows and calves	<ul style="list-style-type: none"> • Do not get between the cow and the calf unless you have a protective barrier to place between them. • Give the cows time and move them slowly when moving cows with calves. • Consider separating the mother and calf completely to be able to work safely with the calf. • Have a barrier between the mother cow and her calf in place when weighing or ear-tagging calves.
Mother cows	<ul style="list-style-type: none"> • Be aware of and keep your distance from aggressive mother cows. • If a cow is suffering from mastitis in one quarter, consider approaching her from the opposite side of the affliction.
Calves	<ul style="list-style-type: none"> • Use proper lifting techniques (use your legs and keep your back straight) when lifting calves and only lift the calf if absolutely necessary. • Keep calves quiet by holding their mouths shut.
Bulls	<ul style="list-style-type: none"> • Never turn your back on a bull or handle bulls alone. • If you are cornered by a bull, repeatedly and loudly yell for help. • Use paddles if they are available. • When a bull is threatening you and if there is no escape route, step sideways out of the bull's vision; this can confuse the bull long enough to get to safety. • Avoid grazing bulls in open areas around children. • Show dominance when around bulls. • Keep bulls moving at a trot, until they are in the paddock and away from the gate. • Keep bulls apart from each other when moving them and stay clear from two bulls fighting. • Make sure your paddocks and fencing are in good working condition and are secure. • Do not move a dangerous bull alone or on foot.

Cattle Working	
Topic	Best Practices
General working	<ul style="list-style-type: none"> • Ensure that workers treat animals in a humane manner as this ensures worker and animal safety. Cattle that are chased, slapped or hit are likely to become agitated more easily, increasing the risk of injury to handlers. • Have an emergency escape plan or route in every yard and pen. • Before you begin working, consider what could go wrong and make a plan for emergency situations. • Reduce stress as much as possible. By doing this, it will reduce animal injury and illness, reduce employee injury and increase overall efficiency. • Exercise caution around newly handled cattle or cattle that are getting introduced to new environments. Make the first interaction with an animal as stress-free as possible. Use calm handling to teach cattle to trust their handlers. Allow cattle time to investigate their environment to satisfy their curiosity. Acclimate cattle to new people or objects. • Walk quietly and confidently toward cattle. • Exert dominance over an animal to control it more efficiently. Exerting dominance does NOT mean you should beat an animal into submission, but it means using the animal's natural behavior to exert dominance and becoming the "Boss Animal." • Do not chase or hit cattle. Avoid violent or harassing touches. • Employ as experienced handlers as possible. • Work in pairs, if possible, particularly when moving cattle. • Never fill a crowding pen more than three quarters full because cattle need room to move and turn around. • Keep your distance from cattle when possible. Leave plenty of room between cattle and people when working animals. • Keep cattle fed and watered as it lessens their stress. • Keep cattle together as they do not like being singled out or separated. • Do not crowd cattle. • Do not assume that restraining cattle removes hazards. • Always be on the alert when working around cattle. Do not assume an animal will remain docile and quiet. • Treat cattle gently when castrating, weaning and the first milking. As a result, they will be less stressed and the animals will most likely not be as stressed or agitated with you in the future. Cattle like to be treated humanely and kindly. • Train workers to recognize the physical characteristics of an animal about to charge or attack. Cattle characteristics include raised tails and pawing the ground. • Cull cattle that have developed dangerous behavior patterns to create a more manageable herd. • Ensure that the use of dogs is limited to pastures and large pens where cattle can easily move away. Cattle are more likely to kick or charge if they are chased by dogs in confined spaces. Keep dogs away from new calves and mothers.

Cattle Working (continued)	
Topic	Best Practices
Rounding up or moving	<ul style="list-style-type: none"> • Focus on getting the lead animals to move in the desired direction and then allowing the rest of the herd to follow. • Avoid isolating individual animals when possible. Isolated animals are more likely to seek escape routes and display nervous behavior, leading to increased injury risk or performance losses. • Round up or move cattle after they have been grazing either in the morning or evening. Avoid handling animals in hot weather. • Use flight zones to help with moving cattle. • Gather and keep together as small a group of cattle as possible and feasible. • Avoid moving or rounding up cattle with calves, if possible. • When cattle are moved into a yard or pen, give them time to acclimate to the new area and settle down by waiting at least 30 minutes before working with them. • Place a companion herd mate in the pen or nearby if an animal needs to be penned away from the herd. It may be easier to move additional cattle along with one that needs to be handled rather than moving just the one animal. • Do not chase lone animals.
Working in cattle chutes/alleys	<ul style="list-style-type: none"> • Work in teams. Do not overcrowd the pen leading to the chute and make sure the cattle have enough room to travel toward the mouth of the chute easily. • Walk alongside the catwalk to keep the cattle traveling forward. • Make sure you are moving cattle through the chute at a steady pace. • Do not put arms or legs through fences or chutes. • Ensure safety around moving parts of the head gate. • Always stand at the end of a slip rail (a bar that can be placed behind cattle to prevent them from backing up) and keep it at arm's length in case it jerks upward. Never stand in front of or behind a slip rail. • The squeeze chute and gate operators should make sure the other workers are clear of any hazard. • The weight of cattle can force you into the chute or gate. Cattle can hit body parts in the chute, so the handler should be aware and cautious of the hazards. • Cattle tend to balk when they have to be moved from an outdoor pen into a building. To help with this issue, line the cattle up in a single-file chute outside. • Only fill the crowding pen half full when leading into a single-file chute. The cattle will move easier. The risk of the gate coming back on the worker will be reduced as well. • Wait until the single-file chute is almost empty before putting more cattle into the crowding pen.
Loading and unloading	<ul style="list-style-type: none"> • Move the animals as quietly and patiently as possible to reduce stress. • Do not get directly behind the cattle. • Cattle do not like being loaded onto a trailer. Cattle need time to investigate and navigate their surroundings. If forced in or moved too quickly, cattle will resist and become hard to handle. Be extremely cautious and vigilant when working with the animals inside the trailer.
Unloading	<ul style="list-style-type: none"> • Give cattle time when unloading them.
Loading	<ul style="list-style-type: none"> • Cattle should be separated out by size and gender and should be loaded into different compartments of a truck or trailer, if possible.
Transit	<ul style="list-style-type: none"> • To prevent livestock from falling over when in transit, drivers should avoid quick stops and sharp turns.

Appendix G – Personal Protection Equipment (PPE) Best Practices

Personal Protective Equipment (PPE)	
Topic	Best Practices
General Working	<ul style="list-style-type: none">• Wear the proper footwear, such as steel-toed or leather boots, when working cattle.• Wear attire and other protective clothing that help reduce injury. These types of clothing include a strong pair of trousers or jeans, long-sleeve shirts, chaps, gloves and coveralls.• Wear little or no jewelry.• Wear safety glasses to protect your eyes from debris or injury.
Branding or castrating	<ul style="list-style-type: none">• Consider wearing cut-resistant or chain mail gloves.• Use the appropriate-sized knife.
Infected animals	<ul style="list-style-type: none">• When a handler is exposed to an infected animal, provide appropriate personal protective equipment, including water-impervious coveralls, gloves, safety glasses and respiratory masks for the task to be performed.

Appendix H - Worksheet for Describing Actions to Eliminate Hazards and Reduce Risks

Actions for Eliminating Hazards and/or Reducing Risks

Action Plan for Eliminating or Substituting Hazards or Implementing Engineering Controls

Priority	Hazard Risk Score	Task	Action	When

Action Plan for Reducing Risk Through Engineering and/or Administration Controls and PPE

Priority	Hazard Risk Score	Task	Action	When

Appendix I - Safety Policy Template

Safety Policies for
Prior to
•
•
•
•
•
During
•
•
•
•
•
•
•

Appendix J - Safety and Health Policy Statement (Example)

Farm _____ Safety and Health Policy Statement

The safety and health of workers and cattle is very important.

Our farm will comply with all applicable workplace safety and health regulations and support and enforce occupational safety and health regulations. Everyone including management will be involved with the safety program. Based on everyone's involvement, our safety and health goals are:

1. Strive to achieve a "zero incidents" goal.
2. Train our work staff to perform all work tasks safely.
3. Provide personal protective equipment (PPE) appropriate for all job activities.
4. Improve and maintain equipment and environmental conditions on the farm.
5. Perform regularly scheduled work inspections, and document and remediate all hazards.
6. Prepare and train all employees to react appropriately under emergency conditions.
7. Establish a continual reporting system for "close call" and "near miss" incidents.
8. Reward workers appropriately for their workplace safety and health achievements.

Owners and farm managers are responsible for training workers in specific safe work practices. Owners and farm managers must enforce company policies and make sure everyone is following proper safety procedures. Everyone working at Farm _____ is responsible for safety and everyone is required to participate in reporting accidents, recognizing hazards and unsafe acts, and wearing proper personal protective equipment.

The following workplace safety rules apply to everyone employed at this farm operation:

1. No employee is required to do a job that he or she considers to be unsafe.
2. No horseplay will be tolerated at our farm worksites.
3. No illicit drugs or alcohol are permitted on the farm.
4. Injuries and/or unsafe work practices should be reported to management immediately.
5. Employees are not permitted to operate machines for which they have not received training.
6. Failure to follow these safety rules can result in verbal or written warnings, job re-assignment or retraining, or employment termination.

As a worker of Farm _____, I have read and understand and will abide by the safety and health policies as stated above.

Name of Employee

Name of Owner or Manager

Signature of Employee, Date

Signature of Owner or Manager, Date

Appendix K - Emergency Action Plan

Site Name	
Premises ID Number (PIN)	
Owner/Operator Name	
Phone	
Site Phone	
Cellphone	
Other Emergency Contact	
Site Physical Address (including 911)	
Address	
Directions to Site	
Important Telephone Numbers	
Organization/Person Name/Notes Number	
Rescue/Ambulance	
Fire Department	
Sheriff	
Highway Patrol	
Police	
Hospital/Clinic	
County Emergency Management Coordinator	
Local Poison Control Center	
Center for Agricultural Security	
Herd Veterinarian	
State Veterinarian	
Extention Personnel	
DNR	
Manure Applicator	
Equipment Dealer	
Agrichemical Dealer	
Electric Company	
Water Company	
Natural Gas/Propane Supplier	
School(s)	
County Road Department	
Other County/Township Offices	
Other	
Other	

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