

IMPLEMENTATION OF INDUSTRY-ORIENTED ANIMAL WELFARE AND QUALITY  
ASSURANCE ASSESSMENT TOOLS IN COMMERCIAL CATTLE FEEDING  
OPERATIONS

by

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## **Abstract**

Consumer interest in production agriculture has prompted the beef industry to develop tools to increase accountability of producers for animal management practices. The Beef Quality Assurance Feedyard Assessment, developed by veterinarians, animal scientists, and production specialists, was used to objectively evaluate key areas of beef cattle production such as animal handling, antimicrobial residue avoidance, and cattle comfort in 56 Kansas feedyards. During the assessment, management protocols were reviewed, facilities and pens were inspected, and cattle handling practices were observed. Of the 56 feedyards, 19 maintained complete and current Best Management Practices documentation for all management protocols required by the assessment. During assessment of cattle handling practices, 78.6% of feedyards met requirements for an Acceptable score for all measured criteria. An electric prod was used on only 4.0% of cattle during processing. In addition, 83.0% of feedyards scored Acceptable for stocking rate, feed bunk, water tank, and mud score standards.

**Key words:** BQA assessment tools, audit, cattle, feedyard, quality assurance, welfare

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## **Dedication**

It is a blessing and an honor that I am able to dedicate this thesis to the stewards of the land, the weathered, resilient and proud - the cattlemen and women of Kansas. For the most exceptional cattlemen looking down from heaven on an evolving industry that you helped build, may we do well by you in the years to come.

# **Chapter 1 - Literature Review**

## **Animal Welfare in Beef Cattle Feedlots**

The term “animal welfare” is being utilized more frequently by legislators, consumers, scientists and corporate executives. Classically, animal welfare has included specific practices, tools and values that have been referred to as husbandry.<sup>54</sup> In modern vernacular, animal husbandry or welfare is a term that has various definitions and uses. To some animal scientists, welfare is often objectively measured using biological markers such as cortisol levels or heart rate to understand how an animal reacts to a certain environment.<sup>12</sup> Other scientists use more subjective measures to assess animal welfare and measure behavioral outcomes.<sup>16</sup> The American Veterinary Medical Association defines animal welfare as allowing an animal to demonstrate an adequate state of health, comfort, nourishment, safety, ability to express innate behaviors and freedom of pain, fear and distress.<sup>4</sup> Regardless of the working definition used, welfare often combines the two elements of the animal’s ability to exhibit normal patterns of behavior and the animal’s biological function in order to provide an objective measure for acceptable standards of animal welfare.<sup>17,26,40</sup>

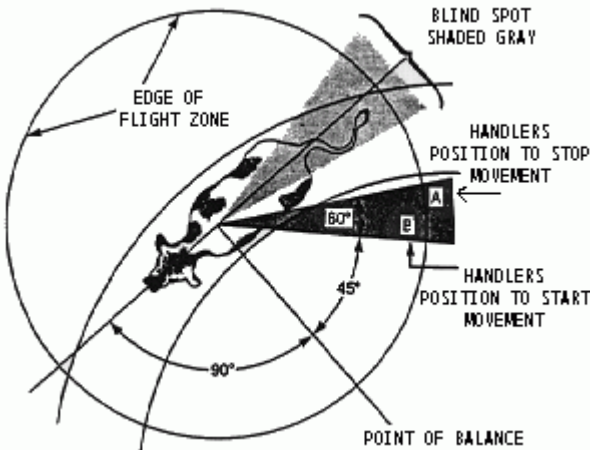
Basic states of animal welfare were first defined in the Five Freedoms developed in the United Kingdom in 1965.<sup>19</sup> These freedoms include: freedom from hunger and thirst; freedom from discomfort, freedom from pain, injury and disease; freedom to express normal behavior; and freedom from fear and distress.<sup>19</sup> The World Organisation for Animal Health makes recommendations for outcome-based measurable standards that can be a useful indicator of animal welfare and outline criteria for behavior, environment and management.<sup>47</sup> These standards can be used to draft assessments or audits to be used in intensive production systems

for measuring animal welfare. Being able to measure animal welfare is an important tool for management. In beef cattle feedlots, animal welfare is an important component of the entire process of raising animals for human consumption that encompasses behavior, environment and management.

### *Behavior*

Ethology is the study of animal's behavior in response to its environment which includes human and non-human stimuli. Humans have been interacting with domestic cattle for 10,000 years.<sup>56</sup> Because of these interactions; we have been studying the natural behavior of cattle in order to modify our role in handling them to provide a higher standard of animal care.<sup>28</sup>

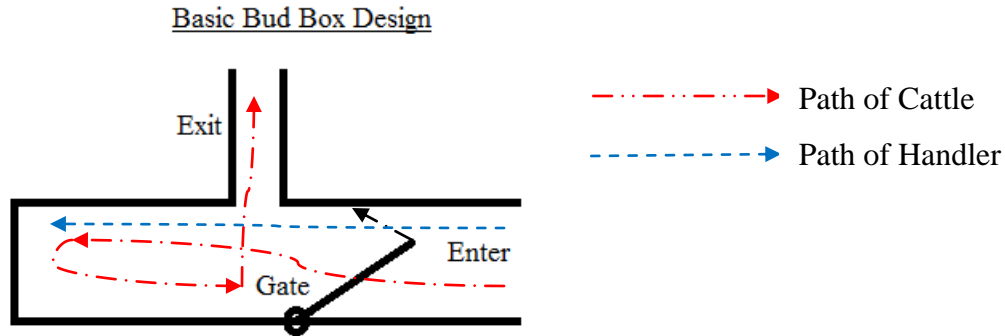
Knowledge about the flight zone of cattle is a central concept that must be understood when working with cattle.<sup>26</sup> When a person enters the flight zone of an animal, the animal will prefer to move away from the person. The size of the flight zone is dependent on the docility of the animal.<sup>26</sup> The best place for a person to work is at the edge of the flight zone, manipulating movements in order for the animals to move away in an orderly manner. As the person moves out of the flight zone, the animal stops moving. The diagram below depicts the animal's flight zone. Tools such as a flag on the end of a stick are used to sort cattle by manipulating movement within the flight zone without having to be close to the animal.<sup>26</sup>



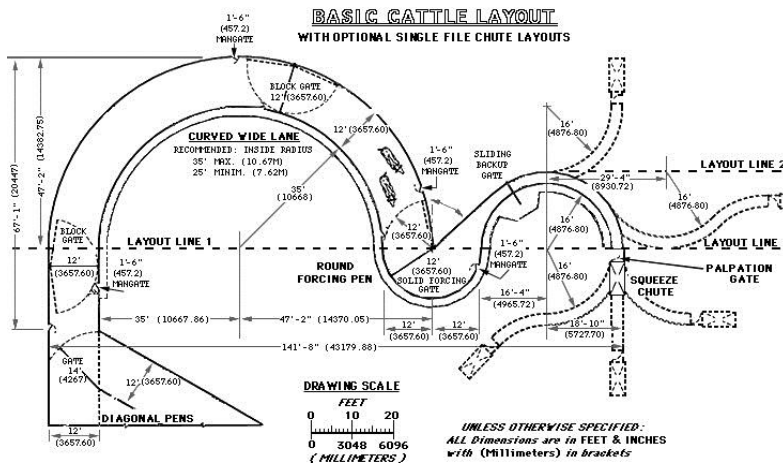
**Figure 1-1**  
Flight zone diagram.<sup>26</sup>

Animal handling has been scrutinized and studied increasingly in recent years. This has provided a framework of understanding for how cattle respond to human handlers in order to move cattle more efficiently through handling facilities.<sup>29</sup> It is especially important to understand the basic principles of cattle behavior when designing cattle handling facilities, as it will provide an easier, safer and more humane manner in which to move cattle through facilities. Through the work of Temple Grandin and Bud Williams, better facility designs have been adopted in the cattle industry in order to utilize the natural instincts of the animal.<sup>29, 65</sup> Cattle handling systems designed by Temple Grandin utilize a wide curved alley that flows into a round pen or tub. When cattle move from the round pen or tub, they file into a curved alley way that leads to the working facility or sorting point. Grandin systems capitalize on the natural instincts of cattle to safely move cattle with low-stress handling techniques. Williams-designed systems are referred to as “Bud Boxes” and are simplistically designed. Cattle are moved into a box-shaped pen that has a width to length ratio of 1:2. A gate is closed once cattle are moved into the Bud Box, latching near the exit lane. The exit lane is a single-file lane that is perpendicular to the box. The cattle

handler moves along the long end of the box on the same side as the exit lane. This movement capitalizes on the natural instinct for cattle to follow each other in the opposite direction in which the handler is moving.



**Figure 1-2**  
Bud box design layout for working cattle.



**Figure 1-3**  
Grandin-designed facility for working cattle.

Good stockmanship was recognized as an important factor in raising cattle in an early article written and published by W.D. Hoard in 1925.<sup>51</sup> and studies have been conducted that

demonstrate the economic benefit of high quality stockmanship.<sup>21, 26, 30</sup> Having an appreciation for cattle behavior lends itself to more appropriate animal handling techniques because it utilizes how the animal prefers to function in a more natural setting.<sup>26</sup> People should modify their actions to handle animals in a calm manner in order to demonstrate good stockmanship skills throughout production agriculture.

### *Environment*

Cattle are able to acclimate to a wide range of climates, but sudden changes in weather can cause stress due to heat, cold or mud.<sup>47</sup> Several factors of production, health, and welfare can be compromised by the climate in which cattle are raised.<sup>34</sup> Research has been conducted in the feedlot industry to alter the microclimate in terms of providing cattle with protection from the elements in order to help cattle acclimate to a variety of weather conditions.<sup>34</sup> Utilizing shades, sprinklers, bedding, wind barriers and diet manipulation have all been described as modifications in a commercial cattle feeding operation to help cattle adapt to various environmental elements.<sup>33,34</sup> Heat stress, cold stress, and pen condition management strategies are employed at cattle feeding facilities across the United States depending on the climate to which the cattle are commonly exposed.

Cattle fed to finishing weights during the months of May through August can often be affected by periods of heat stress due to increased environmental temperatures and relative humidity, and low wind speed.<sup>33</sup> Animal comfort during periods of suspected heat stress can be assessed by monitoring respiration.<sup>24</sup> More importantly, management protocols can be implemented to reduce the risk of heat stress on cattle prior to anticipated periods of high temperatures. Employees in charge of moving cattle at a feedyard should be advised to reconsider the timing of daily activities if weather conditions increase the risk of heat stress.<sup>47</sup>

Utilizing shades and sprinklers is a common practice in the US cattle feeding industry. Recent research has been conducted to evaluate the effect of bedding material on the surface temperature of the pen floor during periods of increased environmental temperatures.<sup>53</sup>

Conversely, when temperatures drop, wind speeds are increased, and precipitation occurs, cattle are at a serious risk for cold stress.<sup>34, 47</sup> One of the easiest methods to minimize cold stress is to provide shelter or bedding for insulation.<sup>34</sup> Shelterbelts or rows of tree wind breaks can provide additional wind protection for cattle and decrease the effect cold stress has on performance.<sup>34</sup> Cold stress management is most important when the environment allows cattle to become wet.

Mud is another environmental factor that must be managed correctly for cattle to be more comfortable and profitable. Cattle housed in muddy conditions eat less frequently which decreases performance. As mud deepens in the pen, energy requirements increase and cattle actually need more feed in order to gain.<sup>35</sup> To aid in management of muddy conditions, bedding can be used to absorb excess moisture, cattle can be provided with a large mound to allow them to get out of the mud, and pen maintenance can be employed to insure proper drainage of pens. Allowing for more square foot space for each animal will also decrease the effects mud has on cattle.<sup>35</sup>

### ***Management***

There are several aspects of management that can come into consideration when discussing animal welfare in beef cattle feedlots. Painful husbandry or management procedures will be the focus of this review because they are most often under public concern and consumer scrutiny. As our society grows more aware of practices in production agriculture that are perceived as painful, the management of these practices must also evolve.<sup>54</sup>

Pain is defined as an adverse sensation or feeling associated with real or impending tissue damage resulting in a behavioral, physiological, or neuroendocrine response that indicates some level of stress.<sup>42</sup> There are procedures performed on feedlot cattle that are thought to cause significant pain and distress to individual animals. These painful procedures include, but are not limited to castration and dehorning. Many of these procedures are performed for reasons of human safety, animal welfare and increased production efficiency.<sup>47</sup> Our ability to address pain during these procedures is often under public concern for animal welfare and offers future options for improvement of animal welfare in relation to the procedures performed.<sup>15,47</sup>

### ***Castration***

The three methods of castration acknowledged by the American Veterinary Medical Association (AVMA), are physical, chemical, and hormonal.<sup>5</sup> Physical (surgical) removal of the testes is the most commonly utilized method.<sup>4</sup> Regardless of the method used, it should be performed on animals younger than three months or at the earliest handling opportunity.<sup>47</sup> All methods of castration inflict acute pain and have some degree of associated risk.<sup>4</sup> Nearly 7 million cattle are castrated annually in the United States<sup>63</sup> and most castrations are not performed by veterinarians, but rather producers perform this procedure by themselves.

In 2001, a study was conducted to compare the effects of both surgical and band castration methods in beef bulls that were 14 months old.<sup>22</sup> There was no difference reported among the study groups of surgical castrates, band castrates, and intact bulls in the amount of time animals spent recumbent post-treatment. The intact bulls exhibited more normal grazing time post-treatment than either the surgical castrates or band castrates.

### ***Dehorning***



Few arguments exist for maintaining horned cattle in a feedlot with consideration given to both human and animal safety.<sup>20</sup> Dehorning is a procedure that involves the removal, either partially or entirely, of the cornified epithelial tissue and the frontal bone core of the horn.<sup>6</sup> It can be performed by physical, chemical, or a combination of the two techniques, and similar to castration, it is a painful procedure that should be performed when animals are younger.<sup>6, 15</sup> Dehorning is a practice utilized in production systems to promote animal and human safety as well as to produce higher quality carcasses due to reduced bruising.<sup>23,36, 50</sup>

Several techniques are effectively used in production systems to dehorn cattle. Certain techniques are preferred when taking into consideration both the age of the animal and the size of the horn. When a calf is less than 8 weeks of age, caustic paste or hot-iron dehorning is often utilized because the horn buds are not yet fused with the frontal bones of the skull. When comparing both techniques for this age group, caustic paste with sedation has been demonstrated to be less painful than hot-iron dehorning with sedation and local anesthesia.<sup>64</sup>

When the horn buds are solidly fused to the frontal bones of the skull, different methods are utilized for dehorning. Amputating the horns using surgical saws, scoops, guillotines or embryotomy wires can effectively remove the horns, but complications with hemorrhage are common from the wound site.<sup>55</sup> Hemostasis is an important factor to keep in mind when employing any of these methods for dehorning.

For bigger cattle with larger horn bases, tipping the horns has been a technique utilized to decrease the size of the horns. There is a pain sensitive core in the middle of the horn and it is important to only take the tip of the horn so that this core is not affected.<sup>55</sup>

### ***Pain evaluation***

Pain is defined as the transduction and eventual perception of some sort of stimulus and is referred to as nociception.<sup>1</sup> With any painful husbandry procedure; producers need to be mindful of the pain inflicted on the animals. Pain is difficult to assess in prey species<sup>41</sup>, but since we continue to perform these husbandry procedures it warrants investigation. Administration of local anesthetics has been investigated and has the potential to decrease acute pain inflicted on cattle being castrated and dehorned.<sup>14</sup> Data has been reviewed on serum cortisol levels, heart rate, interferon production and acute phase proteins that demonstrate evidence of pain associated with dehorning practices.<sup>9</sup> This type of research allows us to more objectively measure pain associated with dehorning and castrating in order to address and minimize pain.<sup>6</sup> In 2007, the American Association of Bovine Practitioners surveyed members to determine perceived pain in dehorning procedures.<sup>18</sup> Dehorning was perceived, by survey-takers, to be more painful in older (> 6 months) beef and dairy calves. An increase in perceived pain was also documented in an increased number of veterinarian's willingness to utilize pain control methods in these older calves.<sup>18</sup>

### ***Non-ambulatory cattle***

Case definitions of non-ambulatory cattle in the beef industry have been varied in the past. The colloquial term “downer” has been used to describe cattle that are acutely injured or too sick to stand or walk.<sup>58</sup> Regardless of the terms used, cattle that are non-ambulatory have been a source of discussion in the beef industry from two main vantage points. From the standpoint of presentation at slaughter, non-ambulatory cattle are to be condemned and must be humanely euthanized and properly disposed of according to Food Safety and Inspection Service (FSIS) regulations.<sup>62</sup> This ruling states that even if cattle have previously passed initial and ante-

mortem inspection by FSIS personnel at a slaughter plant, they are no longer eligible for slaughter.<sup>62</sup>

Non-ambulatory cattle in the feedyard are another point of discussion for both animal welfare and food safety standards. It is estimated in the beef industry that the incidence of on-farm non-ambulatory cattle ranges from 0.7% to 1.1% annually in a study conducted in the 1990's.<sup>57</sup> Regardless of this relatively low incidence, treatment and care of non-ambulatory cattle should be closely managed at a feedyard. Treatment of such cattle should have the end goal of correcting the inciting cause of recumbency and reduce risk of nerve and muscle damage.<sup>57</sup> Non-ambulatory cattle must be placed in an area that provides shelter and the ability to eat and drink.<sup>62</sup> Movement of these animals must be appropriately managed and they should never be dragged.<sup>62</sup> Cattle can be rolled into a sled or loader for transport.<sup>62</sup> When the animal is considered to be in severe pain or the condition is not improving, euthanasia should be considered the best treatment.<sup>57</sup> In a survey of feedlot veterinarians, it has been reported that euthanasia was initiated in all cases of non-ambulatory cattle before 72 hours had passed with no observed signs of clinical improvement.<sup>59</sup>

### ***Euthanasia***

Humane euthanasia is never pleasant for any persons involved in the care of cattle. Euthanasia is one of the most important management points for animal care and food safety.<sup>2</sup> Gunshot has been cited as the most common method utilized for euthanasia in a feedyard.<sup>59</sup> Other appropriate methods include captive bolt and overdose with barbiturate-containing euthanasia solution.<sup>2</sup> Regardless of the method utilized, personnel should be properly trained to carry out each proper technique.<sup>2</sup> Anatomical points of entry for euthanasia by gunshot and captive bolt can be easily located by drawing two lines from the lateral canthus of the eye to the

center of the base of the opposite-side horn. Where these two lines intersect is considered the optimal point of entry.<sup>2,4</sup> Gunshot holds a higher risk to human safety because of the risk of ricochet or misfire.<sup>2</sup> Barbiturate overdose is perceived well by the public and has less risk to human safety, but requires that a licensed veterinarian be present on-farm for administration.<sup>2</sup> All three methods render an animal unconscious to pain and discomfort and provide a rapid method for death.<sup>2</sup>

### **Auditing and Assessments**

An audit represents an official inspection of an operation's management practices or employee performances. Practices and performances are then examined against specifically designed principles and numerically quantified for reporting purposes. An assessment represents a different process and the two terms are often confused. Assessment involves reviewing an operation's management practices or employee performance and provides direction for areas in need of improvement or highlights areas that are sufficiently acceptable.

In the United States, sectors of the production livestock industries have responded to consumer interest in animal well-being by setting forth guidelines for animal care that are science-based and often provide some component of audit or assessment.<sup>61</sup> A multitude of organizations and operations have put forth different programs specifically in the cattle industry. The overall conformation of a welfare-based assessment can vary greatly depending on the specific goals of the program. When looking at an assessment, it is important that the methods used to measure any parameter included in the assessment are reliable, feasible and valid. For the purpose of this literature review, I have included a brief synopsis on a few programs and welfare assessments available to the industry.

## ***BQA***

The Beef Quality Assurance (BQA) program is an initiative introduced to the cattle industry from the National Cattleman's Association.<sup>44,45</sup> It was first established in 1987.<sup>45</sup> The goal of the program is to provide guidance to cattle producers to ensure that animals are raised properly and that the end product is both safe and nutritious for consumers.<sup>45</sup> Management principles are outlined for producers as per the advice from veterinarians, animal scientists, retailers, consumers and state and federal regulators. Producers are also encouraged to become BQA certified following training and subsequent review of knowledge in the good management practices outlined in the BQA Manual. In 2009, the National Feedyard Assessment program was introduced to producers in an effort to offer a benchmarking tool for measuring and assessing management practices, cattle handling and cattle comfort and care on the farm.<sup>65</sup> BQA has been adopted by a large number of operations in the United States and managers in 90% of feedlots believe that the principles of BQA are important to their operation.<sup>61</sup> BQA incorporates principles from several regulatory agencies including the United States Department of Agriculture (USDA), Environmental Protection Agency (EPA), and the Food and Drug Administration (FDA).

## ***American Humane***

The American Humane Association can be traced back to 1877 and claims to have introduced the very first program in the United States that provided certification for animal welfare practices.<sup>3</sup> The program was formerly known as the Free Farmed program and is now known as the American Humane Certified program.<sup>3</sup> It provides a system of verifying and certifying producers that adhere to the animal welfare standards set forth by the American Humane Association. The science-based standards have considerable input from animal

scientists, veterinarians and husbandry specialists and afford the foundation of a labeling program for beef, pork, poultry and dairy products.<sup>3</sup>

### ***Certified Humane®***

The Certified Humane standards were designed as a third-party labelling standard for use of the Certified Humane Raised and Handled ® logo on products produced on farms that passed inspection.<sup>13</sup> The standards were created by a committee of animal scientists and veterinarians. Standards span common animal husbandry topics including animal nutrition, environment, management, health, transportation and slaughter.

### ***Global Animal Partnership***

Global Animal Partnership (GAP) enacted a welfare rating standard for beef cattle in 2009. It includes 5-steps, or levels, of animal welfare that control production standards and management practices for marketing of cattle in each step.<sup>25</sup> GAP is a non-governmental organization that sets welfare standards for the retail market and indicates that consumers are more driven by animal welfare for food choices. Whole Foods is the only retailer that utilizes the GAP standards.<sup>25</sup>

### **Consumer Interest**

Historically, livestock in the US was raised on diversified farming operations that included a multitude of species, grain and fiber crops grown in a calendar year in order to provide income for one or more families. With an increase in both population and demand for food, farms have changed, grown and new technology is being utilized in order to produce more food with fewer resources such as land, water and animals. Urbanization of consumers has also led to a growing disconnect between food producers and consumers.<sup>32</sup> Consumers today are

being bombarded with issues involved in raising animals by the media, legislation, and at the grocery store.<sup>32</sup>

Examples of the effect of consumer concern interest in animal welfare has been seen in the swine industry with the elimination of gestation crates through voluntary ban or legislation in Arizona, Colorado, Florida, Oregon and Smithfield Food farms.<sup>8,31</sup> With the release of the movie *Food Inc.* and authors like Michael Pollan and Anna Lappé on the bestseller's lists, consumers have a heightened awareness and retailers have responded with a number of animal welfare labels at the meat counter.<sup>37</sup> In 2003, the Chipotle corporation began an advertising campaign that used the tag line, "food with integrity," to emotionalize their decision to serve all natural raised meats.<sup>37</sup> The formation of the Pew Commission on Industrial Farm Animal Production (PCIFAP) and publication of a 2008 report is just another example of the political involvement in engaging consumers to take into consideration production practices in animal agriculture.

The general public and consumers demand more information regarding how the animals raised for human consumption are treated on the farm. A series of studies have verified that American consumers agree that the quality of life of an animal used for meat is important, the well-being of farm animals is equal to the well-being of pets, and farm animals should be protected from feeling pain.<sup>52,66</sup> American consumers also agreed that they would pay more for meat coming from farms that treat animals humanely.<sup>52,66</sup> In another survey, consumers responded that food safety and animal welfare were very important.<sup>46</sup> With this heightened interest and prioritization, animal scientists, veterinarians and industry professionals have responded and begun to conduct studies and programs that allow for a more transparent view of the industry to consumers. Livestock producers share the responsibility for the welfare of their

animals with other service industries such as transporters, slaughter houses and veterinarians, which complicates the issue of ensuring animal welfare.<sup>49</sup>

## **Conclusion**

Animal welfare in beef feedlots is an important management factor for the beef industry. Numerous audits and assessments exist for measuring animal handling, comfort, care and management practices within commercial cattle feeding operations. Growing consumer interest has prompted the industry to respond by providing tools for the proper measurement of management practices and overall animal welfare in the production system. Therefore, an assessment tool was identified to measure the feedyards' progress in the areas of animal care. The assessment tool chosen was developed by members of the cattle industry, animal scientists and veterinarians.

## **Study Objectives**

Consumer interest in animal welfare standards and on-farm assessment of practices has been increasing in recent years<sup>32</sup>. Several assessments and audits have been introduced in the cattle industry (Certified Humane, American Humane, GAP, etc.) Since 91 percent of cattle feeding operation managers are familiar with BQA, it was decided to utilize this industry-oriented assessment tool for the study. The objectives of this study were as follows:

1. Implement an industry-oriented animal welfare and quality assurance assessment in a majority of cattle feeding operations within the state of Kansas.
2. Evaluate current management practices and subsequently measure cattle handling, comfort and care in cattle feeding operations within the state of Kansas.



# **Chapter 2 - Implementation of industry-oriented animal welfare and quality assurance assessment tools in commercial cattle feeding operations**

## **Introduction**

Consumer interest in how food is produced, coupled with increasing access to information about production agriculture,<sup>2</sup> has prompted many sectors of the food chain to seek improvement in accountability of animal producers for animal welfare and quality assurance practices.<sup>11,27</sup> With increasing pressure from consumers and retailers, production standards and audits have been developed and utilized for dairy production, laying hens and broilers, and for beef and pork slaughter plants.<sup>27,39</sup> The effectiveness of animal care standards depends on establishment of auditing systems that ensure best practices and sets goals for improvement.<sup>39</sup>

The Beef Quality Assurance Program (BQA) was established by the National Cattleman's Beef Association (NCBA) in 1987.<sup>45</sup> The BQA program provides producers with production guidelines developed by experts in the industry, including animal scientists, veterinarians, meatpackers, retailers, and regulators. The goal of BQA is to assure beef product quality and safety, as well as proper animal care. Guidelines and protocols are often modeled after Hazard Analysis Critical Control Point principles.<sup>45</sup>

Although the beef cattle industry has expended significant effort defining standards of care and best management practices, historically little has been done to evaluate implementation of standards through the use of assessment or auditing tools. The NCBA first introduced a BQA assessment tool in 2008,<sup>44</sup> and currently feedlot, stocker, and cow/calf assessments are

available.<sup>44</sup> A 2011 study reported that 95.1% of feedyard managers were familiar with the BQA program, and 90% indicated that BQA practices were somewhat or very important to their operation.<sup>7</sup> As a result, the industry-designed BQA assessment tool was chosen for this study as it most closely follows the standards of care adopted by the industry, and is endorsed by several groups outside of the industry.

Putting the assessment into action, while concurrently tracking outcomes and progress, can increase producer accountability for livestock management practices. On-farm auditing is considered essential to maintain consumer confidence in production practices.<sup>57</sup> At the same time, assessments can provide objective benchmarking of implementation of new standards of care in the future, and prepare producers for an audit. Because managers often only manage things they can specifically measure,<sup>28</sup> benchmarking the categories measured in this assessment can help improve overall management in feedyards. The objectives of this study were 1) to assess the extent of implementation of BQA standards within the feedyard industry in Kansas, 2) to identify production practices that exceed BQA standards, and 3) to identify areas needing improvement.

## **Materials and Methods**

The BQA Feedyard Assessment was used to assess feedyards that volunteered to participate in the study.<sup>45</sup> For discussion and evaluation, the feedyard assessment was divided into 3 segments: 1) cattle handling, 2) pen conditions, and 3) documentation of Best Management Practices (BMPs).

Fifty-six commercial Kansas feedyards volunteered to participate in the study, and one-day assessments were scheduled with feedyard management based on response time to initial

contact. Assessments were conducted by either a private-practice veterinarian or Kansas State University personnel trained in both BQA and how to conduct the assessment.

### ***Capacity Groups***

For purposes of comparison, feedyards were placed into capacity groups, either large or small. Feedyards with a one-time capacity of  $\geq 20,000$  head were classified as large capacity feedyards, and those with a one-time capacity of  $< 20,000$  were classified as small capacity feedyards.

### ***Recording the Results of the Assessment***

The forms provided in the BQA Feedyard Assessment list major categories, such as BMPs, and category points, which are specific components of a major category, i.e., training. The measure specifies how a category point is evaluated. Once a category point is evaluated, the result is scored 1 of 4 ways:

- Acceptable/Yes – the measure was satisfied
- Requires Action – the measure was somewhat satisfied, but could use improvement
- Unacceptable/No – the measure was not met satisfactorily

Comments are required if a category point is scored Requires Action or Unacceptable.

The assessment forms provide detailed guidance on the standards that must be met in order for a category point to be scored Acceptable. This guidance makes it possible for assessors to score observations consistently.

### ***Animal Abuse or Neglect Assessment***

Animal abuse and animal neglect are major concerns of consumers. To insure that animals were not abused or neglected, assessors observed cattle in the home pens, hospital pens,

various processing facilities, alleyways, and shipping and receiving areas for evidence of animal abuse or neglect.

### ***Cattle Handling Assessment***

Processing and animal handling practices were observed during routine processing while cattle were worked at each participating feedyard. The goal is to assess a minimum of 100 head of cattle being worked; however, if the pen did not contain 100 head, the assessor evaluated cattle handling for all cattle processed that day. The assessor was positioned in the processing barn to allow observation of cattle handlers moving cattle through the alleys, tub, and into the chute. The assessor scored and recorded cattle handling criteria for each animal, including electric prod use, falling, tripping, vocalization, jumping or running when exiting the chute, and improper restraint (Table 1).

Standards for cattle handling defined in the BQA Feedyard Assessment<sup>44</sup> were used for scoring. For an Acceptable score, cattle handlers had to meet the following standards: use of electric prod  $\leq 10\%$ ; cattle falling  $\leq 2\%$ ; cattle tripping  $\leq 10\%$ ; vocalizing  $\leq 5\%$ ; jumping or running while exiting the chute  $\leq 25\%$ ; and improper restraint during processing = 0%. The number of cattle failing to meet the standard was divided by the total number of cattle observed to determine the score for cattle handling. Feedyards that failed to meet the cattle handling standard for a category point were given an Unacceptable score for that portion of the assessment, and notes were recorded in the Comments section.

### ***Pen Assessment***

Ten pens were selected by the assessor at each participating feedyard to score pen conditions. Because pen layout is not symmetrical in many feedlots, "pen blocks" were identified as needed within the feedlot, and pens were then selected randomly within blocks using a

random number generator. Examples of pen blocks include pens separated from the main set of pens, and pens close to or far away from working facilities.

Stocking rate (space) is defined in the assessment as having ample space to stand up, lie down, and move freely without impediment by other animals. If all 10 pens had sufficient space, the category point was scored Acceptable. If stocking rate was inadequate in 1 or more pens, an Unacceptable score was recorded for the category point.

The assessor also observed and recorded pen mud scores, water tank maintenance, and feed bunk maintenance scores for each selected pen. Pen floor evaluation was determined by a mud score defined as cattle having a dry area to lie down and rest, and absence of mud more than 4 inches (10.2 cm) above the fetlock. In order for water tanks to be scored Acceptable, they could not have manure present in the tank or buildup of algae. Tanks with only sediment present were considered clean and scored as Acceptable. Feed bunks had to be accessible for the cattle, and free of spoiled, moldy, sour, or packed feed to be scored Acceptable. If less than 70% of the pens had an Acceptable mud score, clean and accessible water tanks, or feed bunk maintenance, that particular category point was scored Unacceptable.

### ***Assessment of Best Management Practices Documentation***

The required Best Management Practices are listed in the BQA Feedyard Assessment, and must be in written form and up-to-date at the feedyard. There must be documentation available to confirm that employees are trained to perform specific management tasks.<sup>44</sup> The assessor looked for documentation for the BMP protocols required in the assessment guide. The specific categories of BMPs include residue avoidance and withdrawal compliance, employee training, pen maintenance, euthanasia, handling of non-ambulatory cattle, animal health, biosecurity, disposal of carcasses, medication storage and use, broken needles, medicated feeds,

feed quality, cattle processing, cattle shipping, emergency action plan, feed delivery, feeding of non-ruminant protein supplements, and a veterinary-client-patient relationship. If documentation for a specific BMP was not available or updated to include current protocols followed at the yard, the deficiency was recorded as Unacceptable, and the manager was encouraged to implement standards established in the assessment. To receive a score of Acceptable for an individual BMP protocol, the feedyard had to have documentation on file for the BMP. Any BMP that was missing or not up to date was scored Unacceptable. The definition for each BMP required by the BQA Feedyard Assessment is shown in Appendix 2.

### ***Reporting Results***

Results were recorded by the assessor, and pertinent observations were discussed with feedyard management immediately following the assessment, particularly observations and recommendations detailed in the Comments section of the assessment document. Anonymity was assured by assigning a unique feedyard identification number so that results could be recorded and reviewed at The Beef Cattle Institute without knowing the actual identification of the feedyard. Each manager received a copy of the assessment. Data were compiled and recorded in an electronic database.

## **Results and Discussion**

### ***Capacity Groups***

There were 38 feedyards in the large capacity group enrolled in the study, with a total capacity of 1,796,500 head of cattle. Eighteen small capacity feedyards were enrolled, with a total capacity of 189,000 cattle. The range of cattle capacity in small capacity feedyards was 2,500 to 17,500 animals, while the range in the large capacity feedyards was 20,000 to 135,000 animals. A larger percentage of small capacity feedlots lacked adequate documentation of BMPs

than did large capacity feedlots (Figure 1). Managers of small capacity feedyards stated they did not have time to complete paperwork necessary to develop BMPs because of time demands of managing a diversified operation; many owners of small feedyards had alternate sources of income. Some large capacity feedlot managers expressed the need for staff devotion to the paperwork involved with the assessment, especially the BMP portion, as a reason for lack of updated documentation of BMPs.

### ***Animal Abuse or Neglect***

No animal abuse or neglect was observed at any time during assessments of participating feedyards.

### ***Cattle Handling Observations***

The assessment protocol recommends that 100 head of cattle to be observed during handling, but if the pen does not contain 100 head, evaluate all cattle in the pen. At 1 feedyard only 71 head were observed during cattle handling due to a processing miscommunication; at another feedyard 87 head were observed because no other cattle were scheduled for processing on the day of the assessment.

The only category point failing to score Acceptable was when cattle were improperly caught and restrained, and not corrected prior to conducting processing procedures; this is a zero-tolerance error in cattle handling. Thirteen calves at 7 different feedyards were caught and restrained improperly, and not readjusted prior to processing. Feedyard employees were receptive to corrective recommendations, and many understood why it is a zero-tolerance cattle handling measurement. The outcomes measured for cattle handling at participating feedyards scored within the Acceptable standards range in the assessment (Table 1). When all 6

measurements of cattle handling were combined (driving aides, falling, tripping, vocalizing, jumping, and improper restraint) 79% of the feedyards scored Acceptable.

### ***Pen Observations***

All assessments were conducted from July through April. On average, the feedyards scored Acceptable in each pen condition category based on the standards established in the assessment guide (Table 2). Water tank scores were lower than those recorded for mud scores or feed bunk maintenance, but still met or exceeded the minimum score of 70% required to be Acceptable. When all 3 measurements of pen conditions were combined (feed bunks, water tanks, mud scores), 83% of feedyards were considered Acceptable. Because pen conditions are directly correlated with cattle comfort and care, and require efforts by both management and employees, pen conditions are useful measurements for demonstrating the status of animal care and welfare in the feedyards.

### ***Documentation of BMPs***

Nineteen of 56 (33.9%) participating feedyards had all 18 BMPs documented. The absence of BMPs resulted in feedyards scoring unsatisfactory in this portion of the assessment (Figure 1). The primary reason cited by managers for not producing all required BMPs was the amount of resources required to generate and maintain them. Template BMPs are provided in the assessment, and were subsequently provided to all of the feedyard managers. Templates allow managers to fill in blanks unique to their operation, requiring minimal time to complete. Managers were encouraged to document at least a portion of the BMPs.



### ***Findings of Significance***

Eleven of 56 (19.6%) of the feedyards scored Acceptable in documentation of all BMPs, cattle handling, and pen observations (Figure 2). Ten of these feedyards were in the large capacity group, and 1 was in the small capacity group.

Kansas has a one-time feedyard capacity of 2,370,000 cattle, representing 16.8% of the total US feedlot capacity, while those participating in this study had a one-time capacity of 1,985,500 cattle, or 83.8% of the cattle feeding capacity in Kansas.<sup>43</sup> Results of this study revealed 2 important points regarding the BQA Feedyard Assessment. First and foremost, the assessment allows documentation of accepted practices of care which exceed an industry accepted standard, as well as practices which may need improvement. Secondly, the study demonstrated the successful implementation of the BQA Feedyard Assessment in the commercial cattle feeding industry. By implementing the assessment, implementation of BQA practices can be benchmarked.

A lack of BMP documentation was the most common deficit in BQA implementation in participating feedyards. This was most evident in small capacity feedyards. The assessments were conducted during summer months, and pen and water scores may differ throughout the year. In addition, the presence of an assessor could have altered behavior of feedyard staff members processing cattle. Future studies should conduct assessments throughout the year, and alternate ways to observe processing procedures should be considered to gain more accurate representation of cattle handling; videotaping is a possibility.

### **Conclusions**

Only 19.6% of feedyards in the study received an Acceptable score in all categories of the assessment. The primary reason for not a feedlot to receive a satisfactory score was the lack

of BMP documentation. Results of this study identified specific areas of BQA that need improvement, thereby guiding future training and management emphasis. Continued use of the BQA Feedyard Assessment can measure and identify practices needing improvement, and can guide training necessary for improvement of BQA practices.

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## Appendix 2-1

Definitions for cattle handling observations recorded at each feedyard enrolled in the assessment.

At each feedyard, each category listed was observed and recorded.

| Category        | Definition                                                                                                                                   |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Driving aides   | Use of electric prod with an electric current is being discharged while prod is in contact with animal's skin.                               |
| Falling         | Upon discharge from the working chute, the animal's torso or abdomen hits the ground.                                                        |
| Tripping        | Upon discharge from the working chute, the animal's knee hit the ground.                                                                     |
| Vocalizing      | Animal vocalizes while being restrained in the chute, but prior to any procedure being performed on that animal.                             |
| Jumping/running | Upon discharge from the working chute, the animal reaches speeds greater than trotting or loping or the animal's four legs leave the ground. |
| Miscatch        | Animal is caught by the temples or at any point along the body behind the shoulder and not readjusted before procedures being performed.     |

## Appendix 2-2

Definitions for the Best Management Practices (BMP) recorded at each feedyard enrolled in the assessment. At each feedyard, a BMP was required to be up-to-date for each of the 18 categories.

| Category          | Definition                                                                                                |
|-------------------|-----------------------------------------------------------------------------------------------------------|
| Residue avoidance | Management techniques ensure that protocols are in place to prevent the marketing of cattle that have not |

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|                                         |                                                                                                                                                                                  |
|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                         | met proper withdrawal times.                                                                                                                                                     |
| Training protocols                      | Documented use of a training program for employees.                                                                                                                              |
| Pen maintenance                         | Documented protocol in place for pen maintenance.                                                                                                                                |
| Euthanasia protocols                    | Euthanasia protocols have to follow the guidelines set forth by the American Association of Bovine Practitioners and the American Veterinary Medical Association <sup>11</sup> . |
| Non-ambulatory cattle                   | Protocols in place for dealing with non-ambulatory cattle.                                                                                                                       |
| Health                                  | Documented health protocols in place that addresses disease, prevention, management and treatment.                                                                               |
| Biosecurity                             | Biosecurity protocol in place that addresses visitor logs, staff training, physical security and a current biosecurity plan.                                                     |
| Animal disposal                         | Animal disposal protocol that meets federal, state and local disposal regulations.                                                                                               |
| Medication receiving, storage, handling | Receiving, handling and storing pharmaceuticals protocol.                                                                                                                        |
| Broken needles                          | Documented broken needle protocol.                                                                                                                                               |
| Medicated feed                          | Documented protocol for medicated feed.                                                                                                                                          |
| Feed quality                            | Documented protocol in place for feed quality which includes consultation with a nutritionist, the need to collect, store and analyze feed samples, especially                   |

related to potential quality issues such as aflatoxins and/or pesticide residue.

Receiving/processing

Documented protocol available for receiving/processing cattle including processing crew responsibilities, number of cattle received, proper use of implants, processing map and animal/group identification.

Shipping

Documented protocol for shipping cattle including withdrawal verification, safe-to-ship documents and staff-verified shipping records.

Emergency Action Plan (EAP)

EAP in place and readily accessible.

Feed delivery records

Available and accessible feed delivery records.

Supplements

Documentation that no ruminant-derived proteins are being received or fed.

Veterinary/Client/Patient/Relationship  
(VCPR)

Documentation of a VCPR available.

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**Table 2-1**

Cattle handling observations recorded for each feedyard participating in the assessment as an average percentage by capacity group (feedyard size), and then across all feedyards. At each feedyard, 100 head of cattle were observed during processing, and the total observed in each category was divided by 100 and then reported as an average for the capacity group.

| Category         | Small feedyards <sup>2</sup> | Large feedyards <sup>3</sup> | Across all yards <sup>4</sup> | Maximum Acceptable <sup>1</sup> |
|------------------|------------------------------|------------------------------|-------------------------------|---------------------------------|
| Driving aides, % | 6.7                          | 2.7                          | 4.0                           | 10.0                            |
| Falling, %       | 0.1                          | 0.3                          | 0.2                           | 2.0                             |
| Tripping, %      | 1.7                          | 1.9                          | 1.8                           | 10.0                            |
| Vocalizing, %    | 1.1                          | 0.8                          | 0.9                           | 5.0                             |
| Jumping, %       | 5.8                          | 5.9                          | 5.9                           | 25.0                            |
| Miscatch, %      | 0.1                          | 0.3                          | 0.2                           | 0.0                             |

<sup>1</sup>Maximum acceptable percentage of observations made in each category is listed in this column.

If a feedyard did not surpass these percentages, it was considered satisfactory for this portion of the assessment. These percentages are taken from the BQA assessment guidelines.

<sup>2</sup>Small feedyards are those with less than 20,000 animal capacity (n=18).

<sup>3</sup>Large feedyards are those with 20,000 or greater animal capacity (n=38).

<sup>4</sup>All feedyards combined for reporting purposes (n=56).

**Table 2-2**

Pen observations were recorded for each feedyard participating in the assessment as an average percentage in each capacity group and then combined for across all feedyards. At each feedyard, 10 random pens were selected for assessment. If the observations for stocking rate, mud score, water tanks and feed bunks were considered acceptable, the total number of unacceptable observations was divided by 10 and then reported as an average for each group. Reported in this table is the average of the scores for each feedyard within each category: small feedyards, large feedyards and combined across all yards.

| Category            | Small feedyards <sup>2</sup> | Large feedyards <sup>3</sup> | Across all yards <sup>4</sup> | Maximum Acceptable <sup>1</sup> |
|---------------------|------------------------------|------------------------------|-------------------------------|---------------------------------|
| Stocking rate, pens | 0.1                          | 0.0                          | 0.0                           | 3.0                             |
| Mud score, pens     | 0.2                          | 0.2                          | 0.2                           | 3.0                             |
| Water tank, pens    | 1.8                          | 1.6                          | 1.7                           | 3.0                             |
| Feed bunk, pens     | 0.1                          | 0.0                          | 0.0                           | 3.0                             |

<sup>1</sup>Maximum acceptable percentage of observations made in each category is listed in this column.

If a feedyard did not surpass these numbers of pens, it was considered satisfactory for this portion of the assessment. These maximum number of pens for each category are taken from the assessment.

<sup>2</sup>Small feedyards are those with less than 20,000 animal capacity (n=18).

<sup>3</sup>Large feedyards are those with 20,000 or greater animal capacity (n=38).

<sup>4</sup>All feedyards combined for reporting purposes (n=56).

**Figure 2-1**

Best Management Practices (BMPs) were examined for 18 required management protocols as listed in the assessment (Appendix 2). If a feedyard could produce all 18 required BMPs and they were current, the feedyard was considered satisfactory in this portion of the assessment. Feedyards were classified as small or large capacity groups for reporting purposes.

**Figure 2-2**

Feedyards that scored satisfactory in the categories of cattle handling, pen management and Best Management Practices (BMPs) are reported in this figure. If a feedyard was considered satisfactory in a portion of the assessment it is recorded in that category. For feedyards that were able to score satisfactory in all 3 categories of the assessment, they were considered for the overall category of satisfactory ratings. The feedyards are divided into capacity groups (small or large feedyard) for reporting purposes.

**Figure 2-1**





Figure 2-2

