MARCH 1, 2019



# U.S. BEEF INDUSTRY SUSTAINABILITY FRAMEWORK U.S. ROUNDTABLE FOR SUSTAINABLE BEEF

# **TABLE OF CONTENTS**

J.S. BEEF INDUSTRY SUSTAINABILITY FRAMEWORK: INTRODUCTION2
J.S. BEEF INDUSTRY SUSTAINABILITY FRAMEWORK: 1. COW-CALF SECTOR9
J.S. BEEF INDUSTRY SUSTAINABILITY FRAMEWORK: 2. AUCTION MARKET SECTOR
J.S. BEEF INDUSTRY SUSTAINABILITY FRAMEWORK: 3. FEEDYARD SECTOR58
J.S. BEEF INDUSTRY SUSTAINABILITY FRAMEWORK: 4. PACKER AND PROCESSOR SECTOR 88
J.S. BEEF INDUSTRY SUSTAINABILITY FRAMEWORK: 5. RETAIL AND FOOD SERVICE SECTOR 111
CRITICAL KEY TERMS

# **U.S. BEEF INDUSTRY SUSTAINABILITY FRAMEWORK: INTRODUCTION**

The U.S. Roundtable for Sustainable Beef (USRSB) is a non-profit organization formed in 2015. The USRSB's **mission** is to: Advance, support, and communicate continuous improvement in the sustainability of U.S. beef production by educating and engaging the beef value chain through a collaborative multi-stakeholder effort.

The mission helps advance the larger **vision** of the organization: *To make the U.S. beef value chain the trusted global leader in environmentally sound, socially responsible, and economically viable beef.* 

The USRSB set a **strategic objective** to increase the amount of U.S. beef produced utilizing the U.S. Beef Industry Sustainability Framework to 20% by 2020.

The USRSB's scope centers around the mission, vision, and strategic objective through voluntary adoption of the Framework across the beef value chain, with a focus on continuous improvement. This includes education, training, and outreach.

Out of scope for the USRSB, as an organization, are:

- 1) Regulatory affairs and legislative lobbying
- 2) Engagement in business-to-business ventures
- 3) Mandating of standards and/or verification of individual stakeholder performance

While the USRSB recognizes these are important issues for the industry and the value chain, they are not within the USRSB's purpose and scope. However, to date, the USRSB has supported several pilot projects initiated by USRSB members to showcase the success of the U.S. Beef Industry Sustainability Framework in the value chain. The USRSB will continue to explore the challenges and opportunities for continuous improvement across all aspects of the beef value chain.

#### WHO IS USRSB?

In total, the USRSB is composed of more than 100 members across the beef community who share in the organization's vision to make the U.S. the trusted global leader in sustainable beef. The diverse set of members includes cow-calf producers, auction markets, feedyards, packers, processors, retail and food service operations, academic institutions, research organizations, conservation organizations, and allied industry organizations.

To date, USRSB members represent 30% of the U.S. cattle herd and more than 20 billion pounds of processed beef, reaching more than 100 million consumers across the U.S.

Since inception, the USRSB has defined an approach for developing a U.S. Beef Industry Sustainability Framework (see Figure 1). The USRSB has also developed a full set of resources, all packaged within the U.S. Beef Industry Sustainability Framework. These resources include indicators, metrics, and sustainability assessment guides (SAGs) (see Figure 2 below) that members of the beef value chain can use to assess their individual sustainability efforts.

#### THE BEEF VALUE CHAIN

The U.S. Beef Industry Sustainability Framework addresses the following sectors of the beef value chain:

- Cow-Calf: The Cow-Calf Sector represents cattle production beginning on the ranch, where calves are born. This includes the time calves spend with their mothers all the way through when calves begin grazing on grass pastures after weaning. The Cow-Calf Sector also represents stocker and backgrounder operations, where cattle are at times sent when they are between six to 12 months of age, to continue growing.
- Livestock Auction Markets: The Auction Market Sector includes companies facilitating the sale of calves, as well as stockers, backgrounders, and feedyard operations.

3) Feedyard: The Feedyard Sector



Figure 1: USRSB's Organizational Scope

represents operations where cattle are fed a carefully balanced diet composed of grains, grasses, and renewable feedstuffs.

- 4) **Packing and Processing Plants:** The Packing and Processing Plant Sector encompasses facilities where cattle are sent to be harvested and where beef is processed, packaged, and distributed to retail and food service companies either directly or through another processing facility.
- 5) **Retail and Food Service:** The Retail and Food Service Sector includes businesses providing beef to consumers, such as grocery stores, mass merchandisers, hotels, restaurants, and others.

# APPLYING THE U.S. BEEF INDUSTRY SUSTAINABILITY FRAMEWORK TO THE VALUE CHAIN

The Framework is intended to help continually and voluntarily improve the sustainability of U.S. beef, but the USRSB does not believe this is achieved by checking boxes. By utilizing the Framework, the beef value chain commits to continually seeking opportunities to improve. In turn, the Framework will help connect the consumer to the beef community, answering questions the consumer may have about beef production.

The Framework structure consists of SAGs by sector, each addressing the six high-priority indicators which are backed by sustainability metrics (see Figure 2). The sustainability metrics for improvements within each indicator are identified for each sector of the U.S. beef value chain. The sector-specific SAGs provide

further guidelines on the purpose, approach, and methods for meeting the metrics, and ultimately improving the six high-priority indicators. Realizing the diversity in operations across the U.S. (sizes, regions, environmental factors, etc.), the Framework is intended to be applicable to most situations in the beef value chain.

#### HOW DID THE FRAMEWORK GET TO THIS POINT?

The USRSB membership first aligned on a singular definition for sustainable beef: a socially responsible, environmentally sound, and economically viable product that prioritizes planet, people, animals, and progress. From there, members focused on two fundamental questions. What factors are most important to producing sustainable beef? How would each sector measure progress?



More than 80 USRSB members worked together to develop indicators around factors most important to beef sustainability, as well as metrics for each of those indicators which are the guidelines for measuring progress. The USRSB

Figure 2: Resources included in, and organization of, the Framework

members sought guidance and support from a technical facilitator through the University of Arkansas.

Early stages of the development process resulted in approximately 160 draft indicators. These draft indicators fostered discussion that helped members identify the final six high-priority indicators:

- 1) Water Resources
- 2) Land Resources
- 3) Air and Greenhouse Gas Emissions
- 4) Efficiency and Yield
- 5) Animal Health and Well-being
- 6) Employee Safety and Well-being

The group agreed unanimously that some draft indicators, including Consumer Perception, Transparency, Food Safety, and Profitability, actually reflected requirements of doing business that crosscut across all sectors and would therefore not be identified as high-priority indicators. For example, Food Safety was not selected as an indicator because it is a precompetitive criterion for the viability of the beef value chain, touching every facet of beef production, processing, distribution, and consumption. Additionally, USRSB members deemed Profitability as foundational across all indicators. Additionally, due to the multistakeholder nature of the USRSB, which includes direct competitors, there are legal and ethical concerns regarding discussions around pricing and profit.

Next, the USRSB developed metrics within each high-priority indicator, for each sector. The USRSB agreed that each sector within the beef value chain was responsible for determining the best way to approach and develop metrics for itself. This determination allowed each sector to approach indicators in ways that were most impactful and relevant. While sectors led the development, they actively engaged other stakeholder groups, including civil society and allied industry members.

The metrics then needed a technical guidance document that provided additional tools and resources for the value chain. This led to the development of SAGs. Much like the metric development process, value-chain sectors took the lead in developing these resources.

A draft version of the Framework was first presented internally to USRSB members. In total, members submitted more than 1,250 comments over an 18-month period. These comments assisted in finalizing a draft Framework that was made available for two rounds of public commentary (see Figure 3). During the first round of open



Figure 3: Process for sustainability framework development

public commentary, USRSB received more than 450 comments. During the second round of open public commentary, USRSB received more than 100 comments. The public comments were thoughtfully reviewed and responded to, and when deemed to be an improvement in line with the USRSB vision, mission, and scope, changes were made to the Framework to reflect public feedback. In total, the Framework represents six high-priority indicators which are supported by 51 metrics, across 27 SAGs all developed with input from five official review rounds and over 1,800 total internal and public comments.

This process has led the USRSB to where it is today. Much of the work conducted to date around the Framework is related to improving consumer confidence in the beef industry by transparently sharing information and proving the industry is committed to continuous improvement.

# BENCHMARKING AND DEMONSTRATING PROGRESS

Sustainability cuts across social, economic, and environmental domains, and it is about continuous improvement of a system. Thus, the USRSB focuses on improving and positively impacting sustainability for the entire beef industry, which the USRSB believes is achievable through robust adoption of the U.S. Beef Industry Sustainability Framework. To show this progress though, measurement over time is required.

Benchmarking is critical to the U.S. beef industry's sustainability efforts. The USRSB has committed to measure and document impacts of the Framework over time and will use surveys and reported information to measure its implementation effectiveness.

Additionally, the USRSB will use the 2013 U.S. Beef Life Cycle Assessment and its subsequent future updates to benchmark and measure industry-wide progress on sustainability outcomes. A **Life Cycle Assessment** (LCA) is an environmental assessment tool that allows for the accounting of environmental impacts across the entire beef value chain, from cradle to grave, or in the case of beef specifically, from feed production to the consumer. The LCA will allow the U.S. beef industry to identify "hot spots" along the value chain that can be targeted for improvement. Additionally, the LCA will help organizations and individuals within the beef value chain understand which impacts are under their direct control and which impacts are upstream/downstream and therefore more difficult to change. The LCA will be a critical component of the beef community's evaluation of its progress on the sustainability journey and the effectiveness of the Framework metrics to impact this journey.

The National Cattlemen's Beef Association, acting as a contractor with the Beef Checkoff<sup>1</sup>, made an investment in benchmarking the U.S. beef industry using LCA methodology. A complete cradle-to-grave analysis of U.S. beef was conducted, peer-reviewed, and published in the *International Journal of Life Cycle Assessment*<sup>2</sup>.

# LCA Results and Connections to the U.S. Beef Industry Sustainability Framework Indicators

The LCA funded by the Beef Checkoff examined several impact categories that overlap with the Framework's high-priority indicators (Table 1).

Table 1. Relationship between the U.S. Beef Industry Sustainability Framework's indicators and LCA Impact Categories

U.S. Beef Industry Sustainability Indicators	LCA Impact Category
Land Resources	Land use
Water Resources, Land Resources	Acidification potential
Water Resources	Assessed and absolute water use
Water Resources	Water emissions
Efficiency and Yield	Resource consumption
Efficiency and Yield	Solid waste
Efficiency and Yield	Cumulative energy demand
Air and GHG Emissions	Photochemical ozone creation
Air and GHG Emissions	Ozone depletion potential
Air and GHG Emissions	Global warming potential
Employee Safety and Well-being	Toxicity potential

The beef industry LCA concluded that beef cattle production in the U.S., including all feed production, electricity use, fertilizer use, and fossil fuel combustion, is 3.3% of total U.S. greenhouse gas emissions. Corn going to feed grain-finished beef cattle in the U.S. represents only 10% of harvested corn grain acres, which is eight million acres and approximately 2% of total U.S. cropland acres. It only takes 308 gallons of water to produce a pound of boneless beef and water use by beef is around 5% of total U.S. water withdrawals. Plus, this water is recycled in the environment. Also, fossil fuel use in beef cattle production represents just 0.7% of total fossil fuel use in the U.S.

Opportunities to further reduce impacts are discussed in detail within the full peer-reviewed beef system LCA article, but some highlighted opportunities include more efficient cattle production (captured in the Efficiency and Yield Metrics of the Cow-Calf and Feedyard Sectors) and reducing refrigerant emissions and waste at retail and restaurants (Air and Greenhouse Gas Emissions, and Efficiency and Yield Metrics for the Retail and Food Service Sector). Each sector of the beef value chain has a role to play in the continuous

https://doi.org/10.1007/s11367-018-1464-6

<sup>&</sup>lt;sup>1</sup> The Beef Checkoff Program is a beef producer-funded marketing and research program designed to increase domestic and/or international demand for beef. The Cattlemen's Beef Board and the U.S. Department of Agriculture oversee the collection and spending of checkoff dollars.

<sup>&</sup>lt;sup>2</sup> A life cycle assessment of the environmental impacts of a beef system in the USA; Asem-Hiablie, S., Battagliese, T., Stackhouse-Lawson, K.R. et al. Int J Life Cycle Assess (2018).

improvement of U.S. beef sustainability, which is a key reason behind USRSB's approach of each sector developing its own metrics for each indicator.

The USRSB's model for metric development (sector-specific development) aligns with the LCA's findings that support the unique opportunities each sector of the beef value chain has in the continuous improvement of U.S. beef sustainability. Further, alignment of the Framework high-priority indicators with the LCA-identified opportunities for improved sustainability outcomes increase the ability to drive measurable improvement in U.S. beef sustainability in the coming years.

### **Demonstrating Continuous Progress**

As the USRSB works to demonstrate improvement in sustainability of the U.S. beef value chain, several foundational concepts are paramount to success:

- 1) The goal is to achieve progress for the six high-priority indicators, through voluntary adoption of the Framework across the entire beef value chain.
- 2) The USRSB will update, as needed, the comprehensive Framework, inclusive of high-priority indicators, metrics for each sector, SAGs, tools, and resources.
- 3) The metrics developed by the USRSB must be measurable, implementable, and understandable regardless of the scale of the operation. They follow the SMART criteria: specific, measurable, attainable, relevant, and time-bound or trackable. They must be embraced by each sector and not dictated by one sector to another; and sectors must explain how metrics will drive change in the high-priority indicators.
- 4) The USRSB will continue to utilize the U.S. Beef Industry LCA as the guidepost to assess progress and adapt the indicators and metrics to continue the journey of continuous improvement, which is to never stop learning, adapting, and improving.
- 5) The USRSB will work with stakeholders in the beef value chain to determine how metric data can be used in the future to further improve the quality of assessment through the LCA.
- 6) It is essential for the USRSB to interface with other sustainability initiatives to avoid duplication of efforts and reporting, such as Field to Market for feed-related inputs and the Innovation Center for U.S. Dairy/Dairy Sustainability Alliance for dairy calves that enter the beef value chain.
- 7) The USRSB recognizes the necessity of animal identification for the U.S. beef cattle herd to measure success and improvements in sustainability and embraces a nationwide goal of animal identification for purposes of disease traceability, herd security, consumer confidence, quality improvement, international market access, and a means to participate in value-chain programs that offer value-added benefits.

# USRSB KEY PARTNERSHIPS AND RELATIONSHIPS

The USRSB recognizes it is essential to interface with other sustainability initiatives to avoid duplication of efforts and reporting. The USRSB continues to seek out partnerships and alliances with other commodities and sustainability initiatives. The following are brief descriptions of relevant key partnerships and relationships:

#### Field to Market<sup>3</sup>

The USRSB has partnered with Field to Market (FTM): The Alliance for Sustainable Agriculture. The FTM initiative has benchmarked and provided the tools for many of the main grain commodities (including the main grain commodities fed to livestock) to make continuous improvement in their sustainability footprint. The partnership between FTM and USRSB has resulted in a letter of agreement to find areas in which the two initiatives can work together, identify any knowledge gaps, and specifically look at ways to collaborate on feed sustainability.

Currently, FTM and the USRSB are developing a framework to conduct pilot projects. This process will test the tools, metrics, and communication between the commodity grain and beef markets in order to help identify knowledge gaps. The pilot projects will include grain farmers, grain merchandisers, grain cattle feeders, non-governmental organizations, academic institutions, and retail partners who are working to meet consumer expectations around feed production. While this partnership is in its infancy, the USRSB looks forward to sharing progress toward its goals.

#### Innovation Center for U.S. Dairy<sup>4</sup>

The USRSB is working with the dairy industry and their sustainability initiative through the Innovation Center for U.S. Dairy. The two industries are connected in many ways and will continue to share learnings and knowledge.

#### <u>Global Roundtable for Sustainable Beef</u><sup>5</sup>

The beef sustainability conversation is happening globally. The USRSB is a member of the Global Roundtable for Sustainable Beef (GRSB) and serves on the board of directors. The GRSB aids regional roundtables, such as the USRSB, in communicating on global sustainability challenges including antibiotic stewardship, carbon footprint, and land conversion. Most recently, USRSB participated in the development of the GRSB Statement on Antimicrobial Stewardship. The GRSB recognizes that implementation of such a statement must be in line with member countries' laws, regulations, and producer best practices. In the U.S., the governing body over antibiotics is the U.S. Food and Drug Administration (FDA), and the U.S. Beef Industry Sustainability Framework supports the Beef Quality Assurance (BQA) Program Antibiotic Stewardship Manual and 14 Judicious Use Guidelines, in compliance with all FDA rules and regulations.

The USRSB believes that together, as a beef community, we can make a measurable improvement in the sustainability of the U.S. beef industry, and in beef sustainability around the globe. If you wish to join the USRSB in its journey, please visit <u>www.USRSB.org</u> to learn more.

<sup>&</sup>lt;sup>3</sup>https://fieldtomarket.org/ <sup>4</sup>https://www.usdairy.com/ <sup>5</sup>https://grsbeef.org/

# U.S. BEEF INDUSTRY SUSTAINABILITY FRAMEWORK: 1. COW-CALF SECTOR

OVERVIEW OF THE COW-CALF SECTOR	10
COW-CALF SECTOR SUSTAINABILITY ASSESSMENT GUIDES (SAG) Continuous Improvement Process	<b>12</b> 12
SAG FOR INDICATOR 1.1: WATER RESOURCES	14
Metric 1.1	14
Description of Indicator and Metric	15
SAG FOR INDICATOR 1.2: LAND RESOURCES	15
Metric 1.2	15
Description of Indicator and Metric	15
SAG FOR INDICATOR 1.3: AIR AND GREENHOUSE GAS EMISSIONS	16
Metric 1.3	16
Description of Indicator and Metric	
	17
GMP Supporting Discussion for Indicators 1.1.1.2 and 1.3	17
Benefits of a GMP	1/
Adaptation Implementation and Considerations of a GMP	10
Ranch and Farm Resource Inventory	
Producer/Ranch Goals and Objectives	
Stocking Rate	
Pasture Utilization	
Contingency Plan	21
Wildlife Resource Inventory and Management	
Prescribed Burning	22
Evaluation	23
Succession/Transition Planning	
Tools and Informational Resources	24
SAG FOR INDICATOR 1.4: EFFICIENCY AND YIELD	25
Metric 1.4	
Description of Indicator and Metric	
Guidance to Achieve the Metric	
Economics	27
Reproduction	28
Genetics	29
Nutrition	30
Technology and Management Practices	30
Tools and Informational Resources	30

SAG FOR INDICATOR 1.5: ANIMAL HEALTH AND WELL-BEING	31
Metric 1.5	31
Description of Indicator and Metric	31
Guidance to Achieve the Metric	32
Provide Adequate Feed, Water, and Care to Protect Cattle Health and Well-being	33
Provide Disease Prevention Practices to Protect Herd Health	33
Veterinarian-Client-Patient Relationship	34
Pre-conditioning Cattle	34
Antibiotic Stewardship	35
Provide Facilities that Allow Safe and Humane Movement and/or Restraint of Livestock .	37
Provide Personnel with Training to Properly Handle and Care for Cattle	37
Provide Appropriate Transportation for the Cattle	37
Tools and Informational Resources	38
SAG FOR INDICATOR 1.6: EMPLOYEE SAFETY AND WELL-BEING	39
Metric 1.6	39
Description of Indicator and Metric	39
Guidance to Achieve the Metric	39
Tools and Informational Resources	42
REFERENCES	43

# **OVERVIEW OF THE COW-CALF SECTOR**

The Cow-Calf Sector is made up of individuals, organizations and associations of people who are actively engaged in the ownership and management of cattle used to produce beef. For the purpose of this document, the Cow-Calf Sector is inclusive of cow-calf producers (operations that maintain a breeding herd of cows and bulls and produce weaned calves); stockers (operations with grazing or high-roughage diet programs for cattle from the time they are weaned until they are on a finishing ration); and backgrounders (operations with growing programs for cattle from the time they are weaned until they are on a finishing ration).

The U.S. is the world's largest producer of beef, and the U.S. beef industry continuously strives to maintain the high quality of its product for consumers in the U.S. and across the globe. The Cow-Calf Sector is the largest and most diverse value-chain sector. Based on the 2012 Census of Agriculture conducted by the U.S. Department of Agriculture (USDA, 2012), there were 727,906 beef farms and ranches in the U.S. (Figure 1). Of these, 91% were family owned or individually operated. The Cow-Calf Sector also plays an important role through grazing cattle. Grazing livestock is the only means of converting human non-edible grass/forage/biomass to human edible protein and fat, and this is important to meet the increasing protein demand from a growing population. Additionally, well-managed livestock production is one of the only current economically viable large-scale land uses that can be compatible with the conservation of open spaces and natural habitats that sustain wildlife and contribute many other critical ecosystem services and quality-of-life benefits to people.



Figure 1: Beef cattle operations by herd size (USDA, 2012)

Just like the landscape, cow-calf operations differ across the country, from less than 50 head on a few dozen acres to thousands of animals spread across hundreds of thousands of acres (Figure 2). Each operation has unique challenges and management styles and must adapt management practices based on current conditions. Variances in resource stewardship practices are precisely what has allowed cow-calf producers to operate in every state in the U.S. and to provide consumers the broadest amount of choice in the marketplace.



Figure 2: Percentage of calf crop by operation size (USDA, 2012)

The Cow-Calf Sector is a very diverse, complex, and decentralized sector of the beef value chain which makes the sector extremely resilient, and cattle producers tend to be fiercely independent. Change can often be slow, and this sector can have a difficult time quickly adjusting to market demands in the absence of economic incentives. However, change does happen over time. As U.S. beef exports continue to grow, an even greater emphasis will be put on the industry's sustainability and ability to meet future increases in protein demand, with demand primarily coming from growing middle class populations in developing countries. Throughout this growth, it remains critical to balance the protection of natural resources, the well-being of the animals and the needs of the people and communities within and around the beef value chain.

# **COW-CALF SECTOR SUSTAINABILITY ASSESSMENT GUIDES**

The following Sustainability Assessment Guides (SAGs) describe and define the metrics for each of the six high-priority sustainability indicators. The SAGs also include resources and tools which will assist individual operators in assessing their own operations and identifying and implementing opportunities for improvement as it relates to the sustainability indicators. Importantly, adoption and use of the methods and tools described in the SAGs is voluntary. The SAGs are primarily intended to assist operators in improving a wide range of outcomes on their operations over time.

For each of the six high-priority indicators, the SAG will include:

- 1) A description of the indicator to ensure a clear understanding of its intent
- 2) A description of the metric selected to measure the indicator
- 3) Supporting guidelines that elaborate on the context of the metric, including guidelines to address various elements of the metric
  - It is important to note:
    - i) Individual operators may or may not be addressing all the items asked in the supporting guidelines for a particular metric
    - ii) Knowing what some of these additional elements are creates the opportunity for that operator to consider addressing those items going forward
    - iii) Action on the part of the operator to address the listed items, or other items, over time is a means of demonstrating continuous improvement
- 4) Resources for implementation (not meant to be an exhaustive list), including:
  - Recommended practices for improving a particular metric
  - Summary of existing information for that metric
  - Tools (software, apps, hardware, etc.), for supporting metric assessment
  - Case studies
  - Technical support information
- 5) Suggested methods to monitor change and/or progress over time

A key tenet of sustainability is managing any operational task to strive toward **continuous improvement.** As this self-assessment is worked through on an operation, the guidelines below should be considered, and implementation planned in accordance with individual operation environments, situations, and needs. Methods to monitor change and/or progress over time also need to be identified. Incorporating guidelines, such as those identified in this SAG, into routine process reviews will potentially improve both the efficiency and sustainability of the operation.

# **CONTINUOUS IMPROVEMENT PROCESS**

#### INDUSTRY IMPROVEMENT

The farming and ranching industry has made great strides, but further expansion of the number of cowcalf producers in the U.S. who adopt these metrics will improve the sustainability of the beef industry through a cumulative effect. Improvement in industry-wide sustainability outcomes will occur as more producers implement the continuous improvement processes and practices described in this SAG (Figure 3). Producer knowledge and experience will help increase efficiency and effectiveness of implementation. Benchmarking the number of producers across the U.S. who currently implement these metrics will provide the basis for setting goals for expanding adoption rates over the next five years. The U.S. Roundtable for Sustainable Beef (USRSB) will assess the rate of adoption on a regular basis to track needed improvements in these metrics.

Producer knowledge and adoption will also help increase communication of sustainability practices and outcomes with other participants in the value chain. For example, dealing with land tenure issues is a significant challenge for cattle producers who lease pasture from private ranches, state trust lands, or federal public lands. Producers who graze on leased lands often cannot convince the landowner to invest in or allow infrastructure development associated with better management practices. Increased knowledge, adoption, and implementation of these SAGs will eventually provide measurements and benchmarks for producers to more easily communicate the shared benefits of sustainability with landowners.



Figure 3: Continuous improvement process

#### **PRODUCER IMPROVEMENT**

As individual producers adopt the metrics and implement or enhance the plans and programs described in this SAG, their operations will become more sustainable. Regular reassessments, inherent in the continuous improvement process, allow and encourage producers to improve their operations over time according to the needs and opportunities of the individual operation. Due to the complex interactions with landscape, climate, and market conditions, producers must have the flexibility to adapt to changing conditions. Operation priorities and goals may change as circumstances change, whether through

operational improvements or unplanned setbacks such as drought, fire, unexpected expenses, labor/worker issues, family health issues, or emergencies. Regular self-review and evaluation against the indicators and metrics are important to help managers allocate limited resources appropriately to their operation.

# CONTINUOUS IMPROVEMENT IMPLEMENTATION STRATEGY

As producers apply these metrics, and develop and implement the plans and practices described, it may be useful for producers to answer the following questions, as they pertain to their operations, in order to measure the effectiveness of their efforts, document their progress, and ensure continuous improvement:

- 1) Indicator Improvement Process: How will the indicator be improved through implementation of this metric?
  - For example, relating to the Water Resources Indicator, a producer, after identifying the water resources relevant to his/her operation, might ask "How can my grazing management plan help me enhance or protect riparian areas?", or "How can my grazing management plan help me reduce nutrient loads in impaired streams?"
- 2) Metric Success Criteria: What constitutes continuous improvement for the metric as it applies to the operation?
  - For example, relating to the Animal Health and Well-being Indicator, a producer could use a
    decrease in overall antibiotics needed to maintain heard health, or an increase in the percentage
    of calves born to calves weaned, to evaluate the success of their heard health program.
- 3) Metric Implementation Plan: What will be measured, when, how, and by whom?
  - For example, relating to the Efficiency and Yield Indicator, a producer could use the number of calves weaned per cow exposed, or pounds of animal gain per acre of pasture, over a specified time period to measure progress. This type of information could be recorded by the producer or record-keeper (if different than producer) in paper-form such as a National Cattlemen's Beef Association (NCBA) <u>Redbook<sup>6</sup></u>, or an operation's electronic recordkeeping system.
- 4) **Metric Recording Strategy:** How will the metrics be recorded, benchmarked and analyzed within the operation?
  - For example, relating to the Employee Safety and Well-being Indicator, a producer could record and file when employees receive training, what they were trained on, and who conducted the training. This type of information could be recorded by the producer or record-keeper (if different than producer) in paper files or an operation's electronic recordkeeping system.

# COW-CALF SECTOR SUSTAINABILITY ASSESSMENT GUIDE INDICATOR 1.1: WATER RESOURCES

# METRIC 1.1: IS A GRAZING MANAGEMENT PLAN (OR EQUIVALENT) BEING IMPLEMENTED THAT MAINTAINS OR IMPROVES WATER RESOURCES?

<sup>&</sup>lt;sup>6</sup>https://store.beefusa.org/Products/2019-IRM-Redbooks\_\_IRMRED19.aspx

#### DESCRIPTION OF INDICATOR AND METRIC

**USRSB defines Water Resources as:** The volume of water used by a sector for each process, and any impacts on water quality by a sector for each process.

Cattle producers' management decisions and activities can impact the amount of water required to maintain healthy pastures. The health of pastures affects water retention and quality, soil conditions, forage and plant diversity and health, and many other aspects. Ranchers and farmers can optimize forage production, improve ecological function, and promote healthy riparian areas using a Grazing Management Plan (GMP) as a key tool. Therefore, increasing the number of producers who have and implement effective GMPs in the U.S. can have a significant positive effect on the Water Resources Indicator.

Maintaining grassland has important benefits for water quality and quantity. Grazing refines and maintains this service, both ecologically and economically. Managed grazing can reduce the amount of water required to sprout and grow plants, extend the growing phase of those plants, and increase the diversity of plant species in the pasture. It can also increase water infiltration into the soil, slowing runoff, reducing erosion, and storing water in the ground, which extends the life of springs, creeks, and other riparian areas. Many of the same practices that produce healthier pastures have been shown to protect the quality of the water and integrity of riparian areas (Hubbard et al., 2004; DelCurto et al., 2005; Sollenberger et al., 2012). These practices include, but are not limited to, rotational grazing, providing appropriate recovery time for pastures before re-grazing and preventing cattle from congregating near surface water.

A variety of public and private organizations provide assistance for producers in developing and monitoring a GMP, including appropriate technical service providers and private agricultural educational and consulting institutes. Examples of these organizations can be found below in the <u>Tools and</u> <u>Informational Resources</u> section of the GMP discussion in this document.

Taken holistically, improving one of the Water Resources, Land Resources, or Air and Greenhouse Gas Emissions Indicator outcomes tends to improve the others as well, producing co-benefits across these indicators. The GMP is a means for driving improvement across all indicator outcomes of Water Resources, Land Resources, and Air and Greenhouse Gas Emissions.

Further details can be found in the <u>GMP section</u>, following the Cow-Calf Sector Air and Greenhouse Gas Emissions Indicator 1.3 section.

# COW-CALF SECTOR SUSTAINABILITY ASSESSMENT GUIDE INDICATOR 1.2: LAND RESOURCES

# METRIC 1.2: IS A GRAZING MANAGEMENT PLAN (OR EQUIVALENT) BEING IMPLEMENTED TO PROTECT AND/OR IMPROVE THE LAND RESOURCES, INCLUDING SUCCESSION/TRANSITION PLANNING?

# DESCRIPTION OF INDICATOR AND METRIC

**USRSB defines Land Resources as:** The stewardship of terrestrial and aquatic habitats in relation to water, soil, and biodiversity. Impacts of land use and land use conversion, both caused by and prevented by ranching and farming activities and other value-chain land use decisions.

Cattle producers' management decisions and activities can directly impact the health of pastures on which the cattle graze. The maintenance, improvement, and protection of land resources in a cow-calf operation is fundamental to all aspects of beef sustainability, from the economic bottom line of optimizing forages, to animal and natural resources health. Optimizing land resources requires the consideration of many factors, including soil type, climate, vegetative cover, wildlife and their habitat, soil ecological function, cattle health requirements, invasive species (including plants), and many others. Additionally, attention and full consideration of all facets of the business of ranching, including the natural resource health and vitality, is required to allow for the successful transition to future ownership as a cattle operation, thereby preventing land conversion. The most useful tool for cattle producers to manage all these factors to maintain and improve land resources is the implementation of a GMP.

A variety of public and private organizations provide assistance for producers in developing and monitoring a GMP, including appropriate technical service providers and private agricultural educational and consulting institutes. Examples of these organizations can be found below in the <u>Tools and</u> <u>Informational Resources</u> section of the GMP discussion in this document.

The GMP is a means for driving improvement across all indicator outcomes for Water, Land, and Air and Greenhouse Gas Emissions. Taken holistically, improving one of these indicator outcomes tends to improve the others as well, producing co-benefits across indicators.

Further details can be found in the <u>GMP section</u>, following the Cow-Calf Sector Air and Greenhouse Gas Emissions Indicator 1.3 section.

# COW-CALF SECTOR SUSTAINABILITY ASSESSMENT GUIDE: INDICATOR 1.3: AIR AND GREENHOUSE GAS EMISSIONS

METRIC 1.3: HAS A GRAZING MANAGEMENT PLAN (OR EQUIVALENT) BEEN IMPLEMENTED THAT PROTECTS OR IMPROVES SOIL AND PLANT COMMUNITY HEALTH, INCLUDING SOIL CARBON SEQUESTRATION?

#### DESCRIPTION OF INDICATOR AND METRIC

**USRSB defines Air and Greenhouse Gas (GHG) Emissions as**: The cumulative emissions of pollutants, including particulate matter, GHGs, and other gaseous emissions from a sector for each process.

There are two primary air/GHG emissions sources in the Cow-Calf Sector, and GMPs positively impact both sources. The two sources are 1) natural cattle biological activities that result in enteric and manure GHG emissions and 2) risks to carbon storage and sequestration abilities in grazed land soils.

The Cow-Calf Sector is forage-based, meaning the cows, bulls, heifers, and calves primarily consume a forage-based diet, with potentially minor supplementation of byproduct feeds (e.g., distillers' grains, whole cottonseed or meal), or grains. Beyond improved grazing management and forage quality, the ability to affect enteric methane emissions is minimal and must be weighed against other factors such as costs (feed supplements, labor), and full system effects (e.g., a nutritional intervention to reduce enteric methane may increase emissions elsewhere in the system – consequential analyses of enteric methane mitigation strategies are needed). Therefore, the Cow-Calf Sector selected GMPs as the best opportunity for improvement. The GMPs can help manage and positively influence enteric methane emissions through improved animal efficiency and yield and can help manage GHG emissions from manure by promoting the healthy ecological process that rapidly decomposes manure. In general, improving animal efficiency and

yield is the greatest way to reduce GHG emissions, particularly from the Cow-Calf Sector that is primarily extensive and forage-based (Asem-Hiablie et al., 2018). Optimizing animal efficiency and yield generally means fewer inputs and/or outputs per animal (or per pound of beef produced).

The GHG emissions from manure in extensive grazing systems is difficult or logistically impossible to control by people, beyond grazing management. However, in extensive grazing systems, the management of manure is resolved by insects and microbes that consume and break down the manure, returning it back to the soil as fertilizer. Therefore, the area-specific appropriate amount of manure from a volume and time standpoint is important. It provides directly to the life-cycle needs of some species (e.g., dung beetles), and its natural cycle adds nutrients to the soil, which can be beneficial for soil conditions and productivity. Additional research to improve knowledge of animal GHG emissions in extensive production phases is needed to understand how the GHG emissions may be further improved.

Encouraging producers to develop and implement a GMP that incorporates indicators of above- and below-ground ecosystem health is also a key component of this metric, as it positively impacts the ability of grazed land soils to store and sequester carbon. A GMP can drive change in the indicator, not only via improved carbon storage and sequestration, but by potentially lower GHG emissions due to improved pasture and range quality (forage digestibility by the animal; Montes et al., 2013) as well as decreased or prevented erosion and improved dust control through improved ground cover. A GMP can help maintain or improve plant productivity, cover, and diversity (i.e., the above ground ecosystem health), as well as soil health, including carbon storage. Healthy above-ground ecosystems, plus healthy soils, result in healthy root systems (i.e., below-ground ecosystems). This improves water infiltration into and across the soil/roots, along with maintaining appropriate groundcover to help prevent erosion. Implementation of a GMP can also help assure operational succession, in turn helping keep healthy grassland area intact and avoiding significant soil carbon emissions that stem from land conversion. Additional research to improve knowledge of air and GHG emissions in extensive production phases is needed to understand how the air and GHG emissions may be further improved.

The GMP is a key tool used by ranchers and farmers to manage air emissions, improve soil health (which should improve forage production), and therefore promote carbon sequestration and positively influence GHG emissions. Increasing the number of producers who implement effective GMPs in the U.S. can have a significant effect not only on the Air and GHG Emissions Indicator outcomes but also on the Water and Land Resources Indicator outcomes. Assistance for producers in developing a GMP is available through a variety of public and private sources; please see the <u>Tools and Resources section</u> below for a subset of available resources. Further details can be found in the following <u>GMP section</u>.

# **GRAZING MANAGEMENT PLAN (GMP)**

The following GMP discussion is meant to provide added resources and increase understanding and ease of implementation for the metrics across the Water Resources (1.1), Land Resources (1.2), and Air and GHG Emissions (1.3) Indicators.

# GMP SUPPORTING DISCUSSION FOR INDICATORS 1.1, 1.2, AND 1.3

The following is not intended as a template, checklist, or instruction for the creation of a GMP; rather, it presents some examples of the components and benefits/goals of a GMP. Many agencies and institutions, both public and private, are available to assist producers in evaluating or developing a GMP (see <u>Tools and</u> <u>Resources</u> section below). Additionally, water resources, land resources, and air and GHG emissions producer situations will vary depending on geographic location. Academic, extension, non-governmental

organizations, and private resources used for assistance in development of GMPs need to be regionally relevant.

# BENEFITS OF A GMP

A properly implemented and regularly measured GMP that is also aligned with the foundational nature of profitability necessary for a producer's economic sustainability can have significant positive effects on Water Resources, Land Resources, and Air and GHG Emissions Indicators, including:

- 1) Maintained or improved native ecosystems
  - Proper grazing, including targeted grazing, can promote the health of native ecosystems because it can reduce or eliminate the encroachment of invasive species and promote the growth of native species. Co-benefits of maintaining or improving plant community composition include improved water cycle (e.g., enhanced water infiltration), wildlife habitat, and the production of nutritious or palatable livestock forages.
- 2) Protected and/or improved riparian areas
  - Proper stocking rates and rotations can address challenges related to cattle congregation in riparian areas, providing plants along stream banks with the opportunity to recover and flourish and avoiding long-term negative impacts. Co-benefits of improved riparian management include enhanced wildlife habitat and a more effective water cycle in terms of both flows and water quality. This will also improve the wildlife habitat and maintain or improve the livestock and wildlife (animal) carrying capacity.
- 3) Reduced soil erosion and particulate emissions
  - Proper grazing management seeks to ensure that plants retain adequate leaf area after a grazing event for optimal photosynthesis and plant regrowth. This promotes the healthy root systems and associated microbiology in the soil that are key to maintaining and improving productivity over time. A proper GMP also ensures that sufficient groundcover from growing plants and plant litter is present after a grazing event to protect soils from wind and water erosion. Protecting soils from erosion protects soil health, soil carbon, the water cycle, and productivity.
- 4) Optimized plant cover, relative to fire fuel loads
  - Forage plants are also potential fuels for fires. Such fuels can be of value when they are managed through prescribed burns, but they can also contribute to wildfires, which each year causes tremendous damage to human life and property and can also impact wildlife and ecological systems in many circumstances. In addition, wildfires also emit tremendous amounts of GHGs into the atmosphere each year. Livestock grazing needs to be designed to optimize animal health and well-being and residual cover and plant regrowth, but proper grazing management, which consumes grasses and other fine fuels, can help reduce wildfire risk and its negative impacts on people and nature. Such grazing is also often compatible with prescribed burns, which can enhance forage production and wildlife habitat.
- 5) Improve access to water for cattle on pastures
  - Grazing management plans seek to distribute grazing animals across pastures and rangeland to balance stocking rates with forage production. The GMPs also inform how and where to provide water to optimize cattle performance by managing the time and distance cattle travel between forage resources and water. Well-designed water systems also protect riparian areas, enhance groundwater infiltration, and promote stream health.
- 6) Increased forage production and improved utilization
  - The rate of growth of forages in a pasture is directly related to how well the pasture has been managed, not only in recent grazing periods, but also during the previous winter and the prior

grazing season. All other factors being equal, the better a pasture is managed, the more forage it will produce, up to the capability of the soils and the site conditions. A GMP helps ensure proper management of pastures.

- 7) Increase water infiltration and retention
  - Proper GMPs ensure that growing and dormant plants provide adequate residual groundcover and root systems to slow or stop surface water runoff, which increases water infiltration into soils and aquifers. This improves the overall water cycle and soil health factors that are critical to the growth of plants, including forage species.
- 8) Improved wildlife habitat
  - The many positive effects that GMPs can have on the ecological processes outlined in this section will often also improve wildlife habitat. Planning for the specific needs of wildlife is still important; however, some species need structural diversity in their home ranges and others may need conditions present at one end or the other of the successional spectrum (e.g., high or low seral state). It is therefore important to incorporate the needs of such species into GMPs to include long grazing deferments and/or severe defoliations in appropriate locations and at appropriate times within an operation. In many cases, such actions can be integrated with drought planning, fire risk mitigation, weed management, and other important ranch goals.

#### ADAPTATION, IMPLEMENTATION, AND CONSIDERATIONS OF A GMP

Cow-calf operations across the U.S. are diverse and thus the implementation of a GMP will vary from operation to operation. Proper grazing management (the aim of a GMP) means forages are managed so that there is enough leaf left on the plant after being grazed, to maximize photosynthesis and regrowth. However, when developing a new plan or evaluating and measuring a current plan, these key criteria and planning steps cut across the unique geographic regions of the U.S and if implemented, will increase success of the GMP implementation:

- 1) Assess current resource conditions (e.g., make a ranch inventory), relative to potential optimum conditions
- 2) Set ranch goals and objectives designed to move conditions toward optimum
- Select management actions to achieve goals (e.g., stocking rate, timing, duration, rest, intensity, pasture size and number, infrastructure management and/or improvements, business management changes)
- 4) Make contingency plans for drought and other risks
- 5) Conduct regular and repeated monitoring of key indicators and compile resulting information
- 6) Take actions or make operational adjustments based on monitoring results

In addition to the core grazing management components above, the following operational specific conservation considerations may apply to the planning framework. Again, there may be some regional and local variability in considerations, and some listed consideration may not apply in some areas, while others not on the list may be locally relevant:

- 1) Native plants, animals, and habitats/ecological systems
- 2) Rare or unique plant or animal populations
- 3) Soil health and soil erosion risk
- 4) Water quality and water cycle evaluation
- 5) Range/pasture condition or health
- 6) Streamside/riparian areas and wetlands
- 7) Invasive species/weeds

Adaptability is an important characteristic of GMPs. Cattle operations across the U.S. are extremely diverse, and management of water and land resources and air and GHG emissions varies geographically and is dependent on many variables. The GMPs can be tailored to each ranch or farm, based on the resources, conditions, and ecological characteristics specific to each operation and the goals and objectives of the individual producer. This flexibility provides each producer with valuable, customized information, and provides positive benefits to the operation beyond the current sustainability indicators. A GMP can assist a producer to better plan for different scenarios (precipitation, forage, markets, etc.), to support adaptable decision-making and holistic planning. For example, a GMP appropriately tailored for a given cow-calf operation resource base and executed successfully can enhance ecosystems goods and services, such as carbon storage, nutrient cycling, soil health, and wildlife habitat (Teague et al., 2011; Briske et al., 2011; Franzluebbers et al., 2000). The following additional factors should all be considered when developing, implementing, and managing a GMP.

# RANCH AND FARM RESOURCE INVENTORY

A ranch and farm resource inventory serves as an assessment of the resources available for grazing use on a particular property or grazing unit. The inventory provides forage-related information, such as forage amounts and distribution, that enable the land manager to make management decisions within the grazing unit. The inventory further enables the land manager to plan proper forage utilization rates, grazing days per pasture, etc. The inventory additionally outlines and identifies deficiencies in forage resources, such as limited forage availability, presence of toxic plants, invasive weeds, etc. Inventorying and aligning a ranch's forage resources with the rancher's grazing management and business plan goals aids in optimizing operational viability and sustainability (Maczko et al., 2012). The inventory can also include fence, water, and other grazing-related infrastructure, noting its current condition and need for maintenance or replacement.

Lastly, forage inventory data in combination with weather records can assist a rancher in better balancing ranch resource capabilities with the ranch business plan goals and objectives (Hamilton et al., 2011). For this reason, ranchers also may want to correlate temperature, precipitation, and drought condition reports with resource conditions on the ranch. Inventory and monitoring data, as well as grazing management, are useful tools individually, but integrating the two optimizes ranch management sustainability.

# PRODUCER/RANCH GOALS AND OBJECTIVES

Producer/ranch goals and objectives are the expected GMP outcomes as outlined by the land manager. The goals provide the specific criteria for measuring the success of the plan. Goals are further defined with objectives that clearly state the management focus. Goals will vary significantly from operation to operation, reflecting the priorities and preferences of the producer, the anthropogenic (humaninfluenced), and natural environmental conditions, as well as economic and social considerations. Establishing goals and objectives helps clarify priorities, which the producer can use when making management decisions and allocating the ranch or farm resources.

Goals are additionally important because they provide the direction for management actions. Having defined goals also allows adaptive grazing management under shifting environmental and economic conditions to meet management objectives. Adaptive grazing management adds a level of flexibility that often ensures success. Interpretation of selected evaluation criteria is best considered in the context of movement toward a management goal, generally specified in a rancher's GMP. Implementing regular and

repeated GMP monitoring will provide data that a rancher can track to determine if goals are being achieved.

#### STOCKING RATE

Stocking rate is defined as the relationship between the number of animals and the grazing management unit utilized over a specified time period (SRM, 1998). Stocking rates may be expressed as animal units per unit of land area (i.e., number of animal units/acre), and they will differ geographically based on type of soil, forage, season, annual rainfall, invasive plants, and many other criteria. The stock rate is the single most important decision grazing managers will make because it directly affects animal performance and ecological resources. This will ultimately affect the net profit of an operation, regardless of the type of grazing plan or the breed or class of animal chosen. No grazing management system will be effective without calculating and monitoring stocking rates. Range-science-based technical assistance from range management professionals both private and public is available to assist in calculating appropriate stocking rates for pastures and/or entire ranches.

#### PASTURE UTILIZATION

A pasture utilization plan identifies periods of grazing, deferment, and rest for each grazing unit. The pasture utilization plan should be site-specific and focused on management goals. The pasture utilization plan should be designed to be adaptive and flexible to fluctuating environmental conditions that have effects on forage availability. The grazing period within a pasture utilization plan should balance the number of grazing animals with the targeted forage residual stubble height or residual forage amount. Adequate plant recovery periods are the key to successful pasture utilization plans. Properly planned recovery periods allow plant communities to fully recover between grazing events. Calendar dates should only be used as a guide in initial grazing planning. Monitoring pasture utilization, regrowth, and resource goals should drive establishment of recovery periods and grazing frequency and intensity.

The geographic region and the associated complexity of managing the natural resources dictate how producers design their individual pasture utilization plans. Soil health, annual precipitation, growing season length, species complexity, environmental issues, marketing, financing, and personal management decisions all factor into customized pasture utilization plans. Cattle producers in every region of the U.S. have supporting information available to guide them in region-specific pasture utilization planning.

#### CONTINGENCY PLAN

A contingency plan is a tool to assist the land manager in adjusting the grazing prescription to ensure resource management and economic feasibility without resource degradation. Cow-calf producers face a considerable array of risks ranging from financial and market risks to drought, and these risks must be adequately managed to remain a sustainable business operation. As such, every producer needs to have a contingency plan as a component of the GMP. Many cow-calf producers face environmental risks, including drought and fire, that can affect the forage resources available on their operations. While these risks are unavoidable, tools are available to systematically plan for how the operation will continue and recover during such unplanned disruptions (Tolleson 2017; Knutson and Haigh 2013).

The risks faced by cow-calf producers across the U.S. are often dynamic, and thus the correct course of action to continue as a sustainable business operation will be dynamic as well. Consequently, monitoring and evaluating the effectiveness of the plan are key components of a contingency plan.

#### WILDLIFE RESOURCE INVENTORY AND MANAGEMENT

Each grazing operation offers potential for enhancing and protecting wildlife population, some of which present economic and operational resources for producers. Inventories of these resources and strategies for enhancing them can be an important component of a GMP. Some producers possess the expertise to address wildlife management planning and implementation needs; others can utilize the services of state and/or federal wildlife management experts, qualified consultants, appropriate non-government organizations, or academic experts. The following list represents some components of wildlife resource inventory and management plans.

- 1) Assessment of potential:
  - Native plant community composition and structure
  - Native fish and wildlife populations (game, nongame, and rare or unique)
  - Current habitat conditions
  - Future habitat conditions
  - Income from wildlife-based recreation, mitigation credit sales, and other marketable ecosystem services
- 2) Important factors to manage to achieve desired/optimal conditions include:
  - Cattle stocking rates and pasture utilization
  - Prescribed fire and other vegetation management applications
  - Hunting
  - Invasive plants and animals
  - Infrastructure improvements (fencing, water supply, stream crossings, etc.)

#### PRESCRIBED BURNING

The <u>USDA-NRCS<sup>Z</sup></u> and other relevant sources generally describe prescribed burning as fire intentionally applied to a predetermined area, to achieve identified management outcomes, within a prescribed set of conditions and with appropriate safety precautions. Prescribed burning can be beneficial to grazing operations and ecological health in forest lands, grasslands, pasture lands, wildlife lands, hay lands, and other land types. Prescribed burns serve many purposes in grazing lands settings, including:

- 1) Controlling fire susceptible undesirable vegetation
- 2) Managing invasive species
- 3) Controlling plant disease
- 4) Reducing wildfire hazards
- 5) Improving wildlife habitat
- 6) Improving plant production and forage quantity or quality
- 7) Removing duff and debris
- 8) Enhancing seed production
- 9) Influencing grazing distribution
- 10) Restoring and maintaining desired ecological conditions
- 11) Managing native plant diversity, structure, and composition

Depending on geography and management goals, prescribed burning may be a valuable component of GMPs. Several burn planning and preparation considerations are essential to achieving desired outcomes, including:

 $<sup>^{7}</sup> https://efotg.sc.egov.usda.gov/references/public/IA/Prescribed\_Burning\_338\_JS\_2008\_09.pdf$ 

- 1) Prescribed fire should be planned with respect to both the broader landscape and entire grazing operation context.
- 2) Prescribed fire should be carried out according to a thorough burn plan prepared by someone with appropriate experience and expertise and should consider necessary equipment, personnel needs, weather conditions, fuel loads and conditions, natural and created fire breaks, and other plan elements.
- 3) Prescribed fire planning should also consider traffic safety, human health, and regulatory implications of smoke produced during and after the burn.
- 4) Both ecological and grazing productivity outcomes should be considered in selecting the burned and adjacent unburned area size and position.
- 5) Prescribed fire should be managed with regard for wildlife needs, such as nesting, feeding and cover, including impacts on rare and sensitive plants and animals.
- 6) Some prescribed fire situations should also consider potential impacts on historical and cultural resources.

#### EVALUATION

Regular and repeated evaluation (including monitoring and adaptation) of a GMP can further or accelerate improvements, efficiencies, and profitability for operations. Documentation of those improvements can help tell the sustainability story of a ranch or operation.

#### SUCCESSION/TRANSITION PLANNING

One important aspect of the Cow-Calf Sector is its ability to maintain open spaces, natural habitats, and thriving ecosystems, all while contributing to a financially healthy business. Optimizing the land resources is one aspect of maintaining a healthy business operation that can be sold or passed on to future generations in its best condition. One challenge for many cow-calf producers across the U.S. is how to successfully transfer their business to another entity (whether family or not) and maintain its farming or ranching heritage. The Framework provides the following guidance to assist producers in succession planning, which will aid them in avoiding or overcoming the pressure to sell an operation to an entity for a different and sub-optimal use.

Although retirement plans and estate planning to create detailed wills are both components of an effective transition strategy, there are other critical aspects too. Transfer planning encompasses legal and economic decisions and transactions involved in conveying ownership of the business, ranchland, and associated property and assets to the next generation. Succession planning integrates family social decisions involved in managing goals, objectives, values, and potential role and responsibility conflicts that may arise as families discuss transfer of a farm/ranch business, land, and other property (Goetting et al., 2016).

Key considerations involved in transfer and succession planning may include:

- 1) **Inventory of operation and family financials**, including assets and debts, and future needs.
- 2) **Discussion of values, goals, objectives, roles and responsibilities** with family and advisors to identify expectations and define business, personal, and financial plans. This includes daily operation, marketing, and production concerns.
- 3) Identification of issues and creation of an advisory team. Possible participants in addition to family members include an agricultural business consultant, lender, accountant, financial adviser, land-use planner, or conservation planner/land trust representative, lawyer, tax consultant, insurance agent,

financial adviser, and a retirement planner or estate planner to help with legal, financial, or asset management questions.

- 4) Evaluation of the most effective business structure for the ranching operation. Basic types of business organization include sole proprietorships, partnerships, corporations, and limited liability companies, with varying degrees of organizational complexity and transfer perspective. A sole proprietorship is fairly simple. A corporation requires more time and attention to develop and maintain. Partnerships and limited liability companies combine attributes of individual and corporate ownership. Each option offers advantages, depending on family and business needs, tax implications, legal ramifications, financial soundness, etc.
- 5) **Consideration of a conservation easement**. Conservation easements, or other forms of operational diversification, can enable landowners to retain ownership and management control of their ranches while accessing their property value to acquire business equity from partners or family members, make improvements to the operation, help support retirement resource needs, reduce tax burdens, or create equity for heirs. Each of these values may support succession. Donation or sale of an easement can also lower estate values to make land more affordable during the succession process. Conservation easements also help protect land for agricultural production and conserve wetlands, water resources, open space, soil, and/or wildlife and wildlife habitat, depending on the specific program.
- 6) Consideration of a trust. Assets may be placed in trusts to ensure professional management of financial resources. The trust offers financial security for beneficiaries (such as spouses, children, and grandchildren) and designates who will receive the assets once the trust terminates. Some of the many resources available regarding a trust are listed in the <u>Tools and Informational Resources</u> section below. The <u>Land Trust Alliance<sup>8</sup></u> provides a more extensive list of resources specific to accredited national land trusts.

Succession and transfer plans guide transition of a ranching operation's ownership, management, and labor to the next generation, while preserving family harmony and business success. Effectively and successfully transferring a complete business, not just assets such as land or equipment, to future generations requires significant time and effort. However, with more than one-third of agricultural operations expected to transition in the next two decades, the importance of planning for these transitions cannot be overstated.

# TOOLS AND INFORMATIONAL RESOURCES

The following resources can be helpful to producers seeking to improve their operations; it is not intended to be an exhaustive list. USRSB does not own or manage these resources, but they are provided as potential helpful tools for value chain participants.

# Academic and Government Organizations

- 1) <u>Archbold Biological Station<sup>9</sup></u> and other private research and education organizations
- 2) Grassland Productivity Forecast<sup>10</sup>
- 3) Land grant university extension services

<sup>&</sup>lt;sup>8</sup> http://www.landtrustalliance.org/

<sup>&</sup>lt;sup>9</sup> http://www.archbold-station.org/

<sup>&</sup>lt;sup>10</sup> http://grasscast.agsci.colostate.edu/

- 4) <u>National Weather Service: Climate Prediction Center</u><sup>11</sup>
- 5) <u>Noble Research Institute<sup>12</sup></u> and other private research, education, and consulting organizations
- 6) Ranch management consultants
- 7) State cattlemen's associations
- 8) State extension service specialists
- 9) State and/or federal wildlife and environmental experts
- 10) <u>USDA Natural Resource Conservation Service (USDA-NRCS)<sup>13</sup></u>
  - Resource example: <u>National Range and Pasture Handbook<sup>14</sup></u>

#### Non-governmental organizations (NGOs)

- 1) <u>American Farmland Trust<sup>15</sup></u>
- 2) <u>Ducks Unlimited<sup>16</sup></u>
- 3) <u>Pheasants Forever<sup>17</sup></u>
- 4) <u>The Land Trust Alliance<sup>18</sup></u>
- 5) <u>The Nature Conservancy<sup>19</sup></u>
- 6) World Wildlife Fund<sup>20</sup>

# Publications

- 1) Management transitions: handing over the reins<sup>21</sup>
- 2) <u>National Climate Assessment 2014: Agriculture<sup>22</sup></u>
- 3) Passing it on: an estate planning resource guide for Wyoming's farmers and ranchers<sup>23</sup>
- Succession planning for ranchers. California Rangeland Trust News, Winter/Spring 2010 edition. p. 4. Business planning – succession planning – estates<sup>24</sup> (Note, may be listed under Spring/Summer 2010 newsletter)
- 5) <u>Sustainable Rangelands Roundtable<sup>25</sup></u>
  - Resource example: <u>Sustainable Range Management Assessment Guidebook</u><sup>26</sup>

State and region-specific grazing resources are regularly updated online at <u>www.beefsustainability.us</u>.

# COW-CALF SECTOR SUSTAINABILITY ASSESSMENT GUIDE: INDICATOR 1.4: EFFICIENCY AND YIELD

<sup>14</sup>https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

<sup>16</sup>http://www.ducks.org/

<sup>11</sup> http://www.cpc.ncep.noaa.gov/

<sup>12</sup> https://www.noble.org/

<sup>&</sup>lt;sup>13</sup> https://www.nrcs.usda.gov/wps/portal/nrcs/site/national/home/

<sup>&</sup>lt;sup>15</sup>http://www.farmlandinfo.org/landowner-options/transfer-your-farm-or-ranch

<sup>&</sup>lt;sup>17</sup>https://www.pheasantsforever.org/

<sup>&</sup>lt;sup>18</sup>https://www.landtrustalliance.org/

<sup>&</sup>lt;sup>19</sup>https://www.nature.org/en-us/

<sup>&</sup>lt;sup>20</sup>https://www.worldwildlife.org/

<sup>&</sup>lt;sup>21</sup>http://www.srmjournals.org/doi/abs/10.2111/1551-501X-31.2.19?journalCode=rala

<sup>&</sup>lt;sup>22</sup>https://nca2014.globalchange.gov/report/sectors/agriculture

<sup>&</sup>lt;sup>23</sup>http://ces.uwyo.edu/PASSINGITON.asp

<sup>&</sup>lt;sup>24</sup>http://www.rangelandtrust.org/

<sup>&</sup>lt;sup>25</sup>http://www.sustainablerangelands.org/

<sup>&</sup>lt;sup>26</sup>http://sustainablerangelands.org/ranchassessment/guidebook.pdf

# METRIC 1.4: IS THERE A STRATEGY IMPLEMENTED TO OPTIMIZE ANIMAL PRODUCTIVITY THROUGH IMPROVED NUTRITION, REPRODUCTION, GENETICS, TECHNOLOGIES, AND PRACTICES?

#### DESCRIPTION OF INDICATOR AND METRIC

**USRSB defines Efficiency and Yield as:** 1) Efficiency is expressed as the unit of input required to produce a unit of output, and 2) yield is the total product generated per unit of time or space. Both concepts address waste as a negative characteristic and drive toward improved profitability.

Fundamentally, the U.S. beef industry exists to transform lower value inputs (forages, grains) into a highquality and desirable protein source to nourish people. Improving the efficiency of this transformation and minimizing waste (resources, time, capital) throughout the beef value chain is a major driver of beef's continuous improvement in sustainability. Improved efficiency influences other important aspects of beef sustainability, such as long-term economic viability of individual operations within the chain, the wellbeing of employees and rural livelihoods, and the preservation and enhancement of important ecosystems. Central to the efficiency of the entire beef value chain is the productivity and efficiency of the cattle in the Cow-Calf Sector.

Within the Cow-Calf Sector, optimizing animal productivity at the individual operation level influences multiple Framework indicators and aspects important to beef sustainability. Optimizing animal productivity directly affects the operator's profitability, which is key to the economic sustainability of the beef industry. Optimizing animal productivity also influences natural resource requirements and environmental emissions produced per unit of beef. Additionally, animal productivity and animal wellbeing are often positively associated. Thus, the metric for Efficiency and Yield intersects with the indicators (and their associated metrics) for Water Resources, Land Resources, Air and Greenhouse Gas Emissions, and Animal Health and Well-being.

# **GUIDANCE TO ACHIEVE THE METRIC**

In the Cow-Calf Sector, there are multiple ways to improve animal productivity that relate back to both biological and economic efficiency. For example, determining pounds weaned per exposed female (calculated by dividing the total pounds of weaned calves by the number of exposed females), is a common measure in evaluating productivity. This measure embeds economically relevant biological outcomes, such as pregnancy rate, calf death loss percentage, and the genetic potential of the herd in terms of growth and maternal traits. Genetic selection can also play an important role in efficiency and yield by developing cattle that are most efficient for their given environment. See the <u>Genetics section</u> below for additional conversation on this topic.

Optimizing animal productivity of a given operation by using measures such as pounds weaned per exposed female or genetic selection is contingent upon a multitude of factors; thus, the most appropriate strategy depends upon the location and resources available to a given cow-calf operation.

A cow-calf producer's business goals and objectives, marketing realities, and available resources (capital, forage, labor, time, etc.) are key considerations that dictate the best strategy for optimizing animal productivity.

Measurement is key. As the popular adage states, "You can't manage what you don't measure." Additionally, optimizing animal productivity is a long-term and continuous process that requires recording of data and benchmarking key indicators of animal productivity over time to assess if the operator's goals and objectives are met and if adaption is necessary. A long-term time horizon is important due to year-toyear variations in climate, markets, and the long generation interval of beef cattle. This means observing phenotypic change in the herd can require several years. Consequently, trends are more informative than isolated snapshots in time.

Prior to creating and implementing a strategy to optimize animal productivity, a producer/decision-maker should consider how they will define the strategy(ies) to measure efficiency and yield. The definition may consider the goals and objectives of the operation, a resource inventory, and a marketing strategy.

The following sections provide guidance as to how each key consideration affecting animal productivity relates back to the Efficiency and Yield Indicator, and beef sustainability more broadly, as well as specific examples at the individual cow-calf operation level. Although the considerations are presented in isolation, they are in fact related and intertwined with one another. For example, a cow that has nutrient deficiencies will have poor reproductive performance as well. Therefore, it's important for the producer/decision-maker to evaluate these in the context of the entire operation and its goals.

# ECONOMICS

Without a financially robust Cow-Calf Sector, there is no beef industry. Improvements in efficiency and yield can drive economic viability for producers, but without assessment of financial performance, it is unknown whether economic sustainability is being achieved. Economic sustainability in the Cow-Calf Sector also reduces the risk that the lands used for beef production will be converted to other uses, which often cause significant negative impacts on wildlife and other water and land resources, and air and GHG emissions. Assessing financial performance year over year, however, allows producers to ensure they are meeting their financial goals. This information also helps identify areas for continual improvement and management changes that may need to occur.

Ideally, producers record revenues and expenses throughout the year in an accounting format. From these records, financial statements can be generated. These include but are not limited to the cash flow statement, balance sheet (net worth statement), and income and expense sheet (profit and loss). The information from these financial reports allows key performance indicators (KPIs – typically used in financial analysis across industries) to be calculated. Financial KPIs address five key areas:

- 1) Liquidity
- 2) Solvency
- 3) Profitability
- 4) Repayment capacity
- 5) Financial efficiency

Strength in one area does not ensure success. These indicators must be used in a balanced approach. Collectively, achieving a stronger indicator in each area will help ensure that a cow-calf producer is economically sustainable. Further, measuring the KPIs provides for continuous improvement in the Cow-Calf Sector. Combining financial KPIs with production KPIs provides a clearer picture of the long-term viability of the cow-calf operation. This powerful information allows cow-calf producers to continue to drive the efficiency and yield in their operations.

Many resources exist to aid cow-calf producers in not only their recordkeeping but in the preparation of financial documents and assessment of their KPIs. These resources include:

- Becker K., D. Kauppila, G. Rogers, R. Parson, D. Nordquist, and R. Craven. (2014). <u>Farm Finance</u> <u>Scorecard<sup>27</sup></u>.
- 2) Bevers, S. and D. Anderson. (2015). Key Performance Indicator Targets for Beef Cow-Calf Operations<sup>28</sup>.
- 3) Center for Farm Financial Management<sup>29</sup>
- 4) Farm Financial Standards Council<sup>30</sup>
- 5) Purdue University Center for Commercial Agriculture Financial Analysis Resources<sup>31</sup>

#### REPRODUCTION

Reproduction is fundamental to sustainability of both the operation and the entire beef value chain. At the operation level, reproductive performance influences the pounds of marketed weaned calves produced per year relative to inputs. Additionally, reproductive management and performance influence the length and timing of the calving season, which are important considerations in matching animal nutrient requirements to available resources and marketing strategies for calves to be sold. For the beef value chain as a whole, reproduction can be a key driver in determining the size of the supporting herd (cows, bulls, replacement animals) required to produce beef (if raising own replacement heifers).

Ideally, every cow in a herd will produce a live calf that survives to weaning each year. However, there are multiple factors inside and outside of the cow-calf producer's control that detract from this ideal. For example, a bull used for breeding purposes could be unsound, cows could be in an inadequate energy balance or nutrient status at the time of breeding, or herd health could be lacking (e.g., *Trichomonas* can cause abortion). These factors can influence the creation and maintenance of pregnancies. Additionally, a controlled breeding season can help decrease the variation in weaned calf weights at the time of sale, which is desirable to purchasers. The calf crop percentage and weaned weight of calves are major factors that influence cow-calf producer profitability (Figure 4). A comprehensive analysis of all the aspects of a successful reproduction program are beyond the scope of this SAG. However, several excellent informational resources that cover reproduction in depth are listed in the <u>Tools and Informational</u> <u>Resources</u> section at the end of this indicator.

<sup>30</sup>https://www.ffsc.org/

 <sup>&</sup>lt;sup>27</sup>https://www.cffm.umn.edu/Publications/pubs/FarmMgtTopics/FarmFinanceScorecard.pdf
 <sup>28</sup>http://agrilife.org/amarillo/files/2015/12/EAG-018-KPI-BEVERS.pdf

<sup>&</sup>lt;sup>29</sup>http://agrilife.org/amarillo/files/2015/12/EAG-018-KPI-BEVERS.pdf

<sup>&</sup>lt;sup>31</sup>https://ag.purdue.edu/commercialag/Pages/Resources.aspx?cat=Financial%20Analysis



**Figure 4:** Dollars returned per cow (Oct. – Nov. five-year average) as influenced by calf crop percentage and average calf weaning weight. Data are from Georgia and adapted from Stewart and Dyer, 2017.

#### GENETICS

The U.S. beef industry is unique among animal proteins, as optimal animal productivity varies between the different operations in the beef value chain, where cattle nutrients are primarily supplied by forages (cow-calf, stocker, backgrounder operations) versus grains and other concentrate feeds (feedyard operations). Consequently, there can be antagonistic relationships between the sectors of the industry when considering desirable animal performance characteristics.

For example, cattle with a higher genetic potential for growth in the Feedyard Sector of the industry tend to have higher maintenance requirements, appetites, and birth weights. While these traits associated with growth are not detrimental in the Feedyard Sector, cows that have higher maintenance requirements and appetites may be less desirable in the Cow-Calf Sector, depending upon the resources available to a given operator. Higher birth-weight calves may increase the risk of calving difficulty. In such situations, where the cow-calf operator has a low input operation, an increase in cow maintenance and feed requirements over several generations may lead to the need to purchase more feed inputs (e.g., hay) or subject the operator to more risk (e.g., more susceptible to forage resources not meeting animal nutrient requirements during drought conditions). Thus, breeding programs should consider a balance of both desirable maternal traits and growth, performance, carcass quality traits, etc. in the offspring that will be marketed for beef.

Despite the complexity, several decades of research have resulted in genetic selection tools to help cowcalf producers make informed decisions based on their goals and objectives. As outlined by Spangler (2015), a good starting place toward making a bull selection decision is to answer the following three questions:

- 1) What are my breeding/marketing goals?
- 2) What traits directly impact the profitability of my enterprise?
- 3) Are there environmental constraints that dictate the level of performance that is acceptable for a given trait in my enterprise?

The answers to these questions can lead producers to the traits that are economically relevant to their businesses, and multiple trait selection indexes can be used to increase the net merit of a given cow-calf operation's cattle. As a caveat, careful consideration should be given to ensure the selection index fits the breeding objectives (e.g., terminal vs. maternal).

Leading beef extension specialists and other land grant university personnel, breed associations, USDA researchers and informational sources, and other technical service providers can be excellent resources in navigating genetic selection decisions to meet a producer's goals and objectives (http://www.ebeef.org/).

#### NUTRITION

Animal health, well-being, and productivity greatly depends on the nutrient and energy requirements of cattle at their given physiologic state. The efficiency of feed conversion into saleable product (body weight gain in calves) has implications for the economic sustainability of a cow-calf operation, as feed is one of the major costs. Additionally, the efficiency of nutrient and energy retention in the animal has implications for environmental sustainability. For example, improving feed efficiency can minimize the losses of fecal, urinary, and gaseous (methane) nutrients and energy to the environment relative to the product produced. The hierarchy of nutrient and energy partitioning in cattle follows that maintenance requirements should be met before productive function requirements, such as reproduction. Given this, nutritional management is key to a successful reproductive program. Optimizing annual cow costs greatly depends on available feedstuffs and nutritional management, and the nutrition of the cow can also affect the lifetime performance of her offspring. In summary, nutrition is an important consideration to optimize efficiency and yield for a cow-calf operation.

As with other areas outlined in this SAG, more than a century of research is available to help producers make smart nutritional management decisions. Nutrient and energy requirements for cattle have been determined and refined throughout the years, and several hard copy and spreadsheet tools are available for producers that help predict both animal requirements and how feedstuffs are meeting those requirements. Key to this process is having accurate data of animal characteristics (e.g., body weights and condition scores) and the nutrient compositions of feedstuffs. Additionally, there are many technical service providers who can help producers make the best nutritional management decisions that fit each operation's goals and objectives.

#### TECHNOLOGY AND MANAGEMENT PRACTICES

Technology and management practices are related to all of the considerations outlined above. Technology can refer to tools as varied as ionophores, genomic testing, pesticides, growth implants, estrous synchronization tools, and recordkeeping software. Technology can enhance efficiency and the measurement of outcomes at the cow-calf operation. In turn, best management practices, such as those outlined by <u>Beef Quality Assurance<sup>32</sup></u> (BQA) guidelines, allow producers to implement the best strategy to optimize their animal productivity.

#### **TOOLS AND INFORMATIONAL RESOURCES**

<sup>&</sup>lt;sup>32</sup>https://www.bqa.org/Media/BQA/Docs/nationalmanual.pdf

The following resources can be helpful to producers seeking to improve their operations; it is not intended to be an exhaustive list. USRSB does not own or manage these resources, but they are provided as potential helpful tools for value chain participants.

- 1) Becker K., D. Kauppila, G. Rogers, R. Parson, D. Nordquist, and R. Craven. (2014). <u>Farm Finance</u> <u>Scorecard<sup>33</sup></u>
- 2) <u>Beef Cow Efficiency<sup>34</sup></u>
- 3) <u>Beef Improvement Federation<sup>35</sup></u>
- 4) Bevers, S. and D. Anderson. (2015). Key Performance Indicator Targets for Beef Cow-Calf Operations<sup>36</sup>
- 5) Brooks, K., J. Parsons, and J. Jansen. (2017). Profit tip: Marketing plans for your cattle operation<sup>37</sup>
- 6) Center for Farm Financial Management<sup>38</sup>
- 7) eBeef<sup>39</sup>
  - Leading beef genetic extension specialists and other land grant university personnel, breed associations, USDA researchers and informational sources, and other technical service providers can be excellent resources in navigating genetic selection decisions to meet a producer's goals and objectives.
- 8) Farm Financial Standards Council<sup>40</sup>
- 9) Lalman, D. 2017. <u>Vitamin and mineral nutrition of grazing cattle.</u><sup>41</sup> Oklahoma Cooperative Extension Service.
- 10) Purdue University Center for Commercial Agriculture Financial Analysis Resources<sup>42</sup>
- 11) <u>Reproductive Management of Commercial Beef Cows<sup>43</sup></u>

# COW-CALF SECTOR SUSTAINABILITY ASSESSMENT GUIDE: INDICATOR 1.5: ANIMAL HEALTH AND WELL-BEING

# METRIC 1.5: HAS THE OPERATION ADOPTED BEEF QUALITY ASSURANCE (BQA) OR SIMILAR PROGRAM PRINCIPLES INTO MANAGEMENT OF THE FARM OR RANCH?

#### DESCRIPTION OF INDICATOR AND METRIC

**USRSB defines Animal Health and Well-being as:** the cumulative effects of cattle health, nutrition, care, and comfort.

Cattlemen have long recognized the need to properly care for livestock. Ranchers and producers have a moral and ethical responsibility to ensure, to the best of their ability, the health and well-being of the

<sup>&</sup>lt;sup>33</sup>https://www.cffm.umn.edu/Publications/pubs/FarmMgtTopics/FarmFinanceScorecard.pdf

<sup>34</sup>http://www.beefcowefficiency.com/index.html

<sup>&</sup>lt;sup>35</sup>https://beefimprovement.org/

<sup>&</sup>lt;sup>36</sup>http://agrilife.org/amarillo/files/2015/12/EAG-018-KPI-BEVERS.pdf

<sup>&</sup>lt;sup>37</sup>http://beef.unl.edu/marketing-plans-your-livestock-operation

<sup>38</sup>https://www.cffm.umn.edu

<sup>39</sup>http://www.ebeef.org/

<sup>&</sup>lt;sup>40</sup>https://www.ffsc.org/

<sup>&</sup>lt;sup>41</sup>http://factsheets.okstate.edu/documents/e-861-vitamin-and-mineral-nutrition-of-grazing-cattle/

<sup>&</sup>lt;sup>42</sup>https://ag.purdue.edu/commercialag/Pages/Resources.aspx?cat=Financial%20Analysis

<sup>&</sup>lt;sup>43</sup>http://extension.uga.edu/publications/detail.html?number=B864&title=Reproductive%20Management%20of%20Commercial% 20Beef%20Cows

livestock in their care. Animal abuse is not acceptable under any circumstances. Sound animal husbandry practices, based on decades of practical experience and research (Grandin, 2015), are known to impact the well-being of cattle, individual animal health, and herd productivity, and to result in fewer animal losses. Fewer losses also reduces the chance and/or frequency of attracting predators into proximity of cattle. To continually improve cattle health, nutrition, care, and comfort, the Cow-Calf Sector identified the rate of adoption of BQA program principles and practices as the metric for this indicator.

# **GUIDANCE TO ACHIEVE THE METRIC**

The national <u>BQA program</u><sup>44</sup> provides educational resources to improve beef safety and quality while improving cattle well-being. The program also raises consumer confidence by offering proper cattle management techniques and a commitment to quality within every sector of the beef industry. The BQA began efforts more than 40 years ago to develop education and training materials for beef quality and safety assurance. The first National Beef Quality Audit was conducted in 1991.

The BQA tools are the result of years of scientific research and practical experience and are continually updated to provide the latest in animal management information and technologies. These tools include guidelines on the proper administration of animal health products, best management practices for animal well-being, and animal handling recommendations. The BQA recommended practices are consistent with the World Organization for Animal Health (OIE) code, which provides global standards for animal well-being and beef cattle production systems (OIE, 2017).

The BQA program provides producers with training and assessment tools they can use on a voluntary basis to improve their operations. As producers incorporate BQA or similar programs, they can assess and identify the strengths and weaknesses of their operation, and once the weaknesses are identified, they can allocate available resources to improve the weak areas. As more producers adopt and participate in these programs, cattle health, nutrition, care, and comfort are better communicated and improved. A voluntary certification program and a national audit that monitors program uptake across the producer participants are both part of BQA.

In the U.S., cattle are produced in very diverse environments and geographic locations. Due to this geographic and environmental diversity, there is not one specific set of production practices that can be recommended to protect the health, nutrition, care, and comfort of cattle for all producers. Personal experience, training, and professional judgment can serve as a valuable resource for providing proper animal care. However, several key considerations are consistent across the unique geographic regions and operations. For optimal animal health and well-being, ranchers and producers can incorporate these considerations in their management decisions and ranch practices. The four key considerations when caring for animals are:

- 1) Provide adequate feed, water, and care to protect cattle health and well-being
- 2) Provide disease prevention practices to protect herd health
- 3) Provide facilities that allow safe and humane movement and/or restraint of livestock
- 4) Provide personnel with training to properly handle and care for cattle

Implementation of these four criteria, through practices put in place as they relate to the operation, is an important step in ensuring optimal animal health and well-being. The implementation approach at the

<sup>&</sup>lt;sup>44</sup>https://www.bqa.org/

facility or operation level should focus on the planning process, increase situational awareness, and provide guidance and direction for making decisions and allocating resources.

The following information is to be used as an educational resource; all production practices should be adapted to specific needs of individual operations. The BQA program and other agencies and institutions, both public and private, are available to assist producers in evaluating or developing production practices appropriate for their operations.

#### PROVIDE ADEQUATE FEED, WATER, AND CARE TO PROTECT CATTLE HEALTH AND WELL-BEING

Making sure basic needs of cattle are met is a fundamental responsibility of livestock producers. Ranchers and producers should plan for and ensure that cattle have adequate supplies of feed and water.

Diets for all classes of beef cattle should meet the recommendations of the National Research Council (NRC, 2016) and/or recommendations of a nutritional consultant. State agricultural extension services are a potential resource for local recommendations and advice.

Body condition scoring of beef cows is a scientifically approved method to assess nutritional status (Gadberry, 2013; Farney et al., 2016). Body condition scores (BCS) range from 1 (emaciated), to 9 (obese). A BCS of 4-6 is most desirable for animal health, well-being, and production. A BCS of 2 or under is not acceptable, and immediate corrective action must be taken. Maintaining good body condition is not only important for the animal's comfort, it has direct effects on reproductive performance and health. During periods of prolonged drought and widespread shortages of hay and other feedstuffs, the average BCS of cows within a herd may temporarily decline. While this is not desirable, it may be outside the cattle owner's control until drought relief is achieved. During periods of decreasing temperature, feeding plans need to reflect increased energy needs (BQA, 2014).

Good cattle management practices ensure cattle have access to an adequate water supply. Estimated water requirements for all classes of beef cattle in various production settings are described in the National Academy of Sciences, National Research Council's, Nutrient Requirements of Beef Cattle (NRC, 2016).

Euthanasia is a humane death occurring without pain and suffering. It should be utilized when an animal's condition is such that additional treatment options will not be effective. The decision to euthanize an animal should consider the animal's well-being (Dewell et al., 2016; BQA, 2015; AABP, 2013a). Producers should consider all conditions and reasons that indicate distressed animals are candidates for euthanasia and use acceptable methods for conducting euthanasia in cattle, which include gunshot or a penetrating captive bolt with a secondary step to ensure death. People who perform this task should be technically proficient and understand the relevant anatomical landmarks, indications of unconsciousness, and the appropriate methods and protocols used for humane euthanasia of animals. When euthanasia is necessary, an excellent reference is the <u>BQA Euthanasia of Cattle and Calves guidelines<sup>45</sup></u> (BQA, 2015).

# PROVIDE DISEASE PREVENTION PRACTICES TO PROTECT HERD HEALTH

Like other species, cattle are susceptible to infectious diseases, metabolic disorders, toxins, parasites, neoplasia, and injury. Control programs based on risk assessment and efficacy of available products are

<sup>&</sup>lt;sup>45</sup>https://www.bqa.org/Media/BQA/Docs/supplemental\_guidelines\_2014.pdf

generally most effective. Economic losses are reduced through health management programs, which include early intervention and preventative practices and lead to increased animal health and well-being.

Healthy herds are more productive. Management programs should be science-based, common-sense driven, and include general animal health products (e.g., vaccines, vitamins, parasite control products, etc.), along with antibiotics when necessary, meeting rules and regulations. Management programs may include practices such as pre-conditioning calves (discussed below). Working with a veterinarian to determine the risk of infectious, metabolic, and toxic diseases and to develop effective management programs when designing a herd health plan can help ensure the appropriate plan is developed for the operation. This relationship will also assist in incorporation of new technologies and products as they become available and make sense for the operation. A Veterinary-Client-Patient Relationship (VCPR) is strongly encouraged (AABP, 2013b); in some states, like California, a VCPR is required to purchase and administer antibiotics.

#### VETERINARIAN-CLIENT-PATIENT RELATIONSHIP

The VCPR is the basis for interaction among veterinarians, their clients (producers), and their patients (cattle), and it is critical to cattle health and well-being. There is a federal definition for a VCPR, and state definitions for VCPRs exist under the state veterinary practice acts. The FDA has identified <u>the VCPR</u> <u>jurisdiction<sup>46</sup></u> for the respective state or federal definition in reference to the Veterinary Feed Directive (VFD). The VFD is part of full compliance with FDA Guidance <u>209<sup>47</sup></u> and <u>213<sup>48</sup></u> requiring veterinary oversight of all medically important antibiotics used to improve or maintain animal health and well-being.

The BQA program describes the VCPR as the following:

"In general, a VCPR exists when:

- The veterinarian has assumed the responsibility for making clinical judgments regarding the health of the animal and the need for medical treatment, and the client has agreed to follow the veterinarian's instructions.
- 2) The veterinarian has sufficient knowledge of the animal to initiate at least a general or preliminary diagnosis of the medical condition of the animal. This means the veterinarian has recently seen and is personally acquainted with the keeping and care of the animal by virtue of an examination of the animal or the medically appropriate and timely visits to the premises where the animal is kept.
- 3) The veterinarian is responsible for maintaining and evaluating case and treatment records and is readily available for follow-up evaluation in the event of adverse reactions or failure of the treatment regimen."

Producers and their employees need to have the training and/or experience to recognize common health problems and know how to properly utilize animal health products and other control measures. When prevention or control measures are ineffective, the producer should promptly contact a veterinarian for consultation of a diagnosis and treatment program to reduce animal suffering and animal losses.

#### PRE-CONDITIONING CATTLE

<sup>&</sup>lt;sup>46</sup>http://www.fda.gov/AnimalVeterinary/ DevelopmentApprovalProcess/ucm460406.htm

 <sup>&</sup>lt;sup>47</sup>https://www.fda.gov/downloads/AnimalVeterinary/GuidanceComplianceEnforcement/GuidanceforIndustry/UCM216936.pdf
 <sup>48</sup>https://www.fda.gov/downloads/AnimalVeterinary/GuidanceComplianceEnforcement/GuidanceforIndustry/UCM299624.pdf

Pre-conditioning is the process by which calves are weaned and "conditioned" before being moved to grass or a backgrounding yard for growing or sent straight to a feedyard for finishing. The pre-conditioning process improves the likelihood that a calf can deal with future stressors and exposure to pathogens and remain healthy. Pre-conditioning is discussed in the National <u>BQA Manual<sup>49</sup></u> as an option for cattle producers.

Properly pre-conditioned calves should have fewer health problems after they leave the farm or ranch and will (1) require less medication (including antibiotics), which reduces costs as well as the related potential for injection site lesions or tissue residues; (2) reduce death loss; (3) perform more efficiently; and (4) potentially have higher valued carcasses. Pre-conditioning is a value-added management practice that may positively impact animal health and well-being.

Pre-conditioning may be a key component for certain producers, but producers should focus on the needs specific to their operations according to their priorities and resources.

#### ANTIBIOTIC STEWARDSHIP

Antibiotic stewardship encompasses common sense practices adopted and committed to by beef producers, including good recordkeeping, an emphasis on herd health to ensure animal health and wellbeing, responsible treatment of sick animals, and protocols to ensure animals are not marketed with violative antibiotic residues. The producer, packer, and consumer all benefit from healthy cattle in the beef value chain. Positive outcomes of antibiotic stewardship are increased trust and transparency with the end consumer, which can translate into increased demand for beef while ensuring animal health, food safety, and security.

Antibiotics are extremely valuable tools for preventing, treating, and controlling disease in all livestock production. Ability to effectively prevent, treat, and control diseases in cattle directly results in improved animal health and well-being. Additionally, currently available technologies cannot yet replace antibiotics from an effectiveness standpoint. However, the USRSB supports continuing research for antibiotic alternatives. Maintaining the efficacy of antibiotics is a highly complex issue, affecting both human and animal health, and it is a top priority for cattle producers. Antibiotic resistance occurs when bacteria develop the ability to defeat the drugs designed to kill them (<u>CDC Antibiotic Resistance Questions and Answers<sup>50</sup></u>). The responsible and judicious use of antibiotics is one key to addressing this concern.

Separately, a violative antibiotic residue is defined as the presence of veterinary drugs in meat. These residues are usually measured in parts per million or parts per billion. Avoiding violative antibiotic residues has been an important BQA principle for cattle production since the creation of the <u>BQA program<sup>51</sup></u> more than three decades ago. The BQA tools are the result of years of scientific research and practical experience and are continually updated to provide the latest in animal management information and technologies. Avoiding residues remains a top priority for the cattle industry today, and the prevention of violative antibiotic residues is a continuous, coordinated effort between government agencies, veterinarians, and livestock producers beginning before the antibiotic is ever used in animals. The drug approval process, on-farm judicious use of antibiotics, and the U.S. National Residue Program are all specifically designed to prevent animal products with violative drug residues from entering the food

<sup>&</sup>lt;sup>49</sup>https://www.bqa.org/Media/BQA/Docs/nationalmanual.pdf

<sup>&</sup>lt;sup>50</sup>https://www.cdc.gov/antibiotic-use/community/about/antibiotic-resistance-faqs.html

<sup>&</sup>lt;sup>51</sup>https://www.bqa.org/
supply. The FDA also sets withdrawal times for all veterinary drugs, including antibiotics. Practically, the withdrawal time is the amount of time required for the drug to be reduced to a safe tolerance level. The final step in protecting and preventing violative antibiotic residues from entering the food supply is surveillance testing conducted by the USDA Food Safety Inspection Service (FSIS). The overwhelming majority of meat products contain no residues or residues within the government prescribed tolerance levels. If beef is found with violative antibiotic residues, it is removed from the food chain and discarded.

A complete cattle health program will include the judicious use of antibiotics, documented by on-farm recordkeeping and adhering to the following BQA 14 Judicious Use Guidelines detailed in the <u>BQA</u> <u>Antibiotics Stewardship for Beef Producers guidebook</u><sup>52</sup>. The guidelines are developed from the American Veterinary Medical Association (AVMA), American Association of Bovine Practitioners (AABP), and Academy of Veterinarian Consultants (AVC) guidance on appropriate Veterinary Antibiotic Use and are updated systematically to stay aligned with current guidance.

- 1) **Prevent problems:** Emphasize appropriate husbandry and hygiene, routine health examinations, and vaccinations.
- 2) Adhere to FDA guidance: Follow label instructions and FDA guidance for the use of all antibiotics. The use of antibiotics medically important in human medicine should only be used after careful consideration. If medically important feed grade antibiotics are used, they must be under the guidance of a Veterinary Feed Directive (VFD).
- 3) Select and use antibiotics carefully: Consult with your veterinarian on the selection and use of antibiotics under the premise of a valid Veterinarian-Client-Patient-Relationship (VCPR). Have a valid reason to use an antibiotic. Appropriate therapeutic alternatives should be considered prior to using antimicrobial therapy.
- 4) Use the laboratory to help you select antibiotics: Cultures and sensitivity test results should be used to aid in the selection of antibiotics, whenever possible.
- 5) Combination antibiotic therapy is discouraged unless there is clear evidence that specific practice is **beneficial:** Select and dose an antibiotic to affect a cure.
- 6) **Avoid inappropriate antibiotic use:** Confine therapeutic antibiotic use to appropriate clinical indications, avoiding inappropriate uses such as for viral infections without bacterial complication.
- 7) **Treatment programs should reflect Best Use Principles:** Regimens for therapeutic antimicrobial use should be optimized using current pharmacological information and principles.
- 8) Treat the fewest number of animals possible: Limit antibiotic use to sick or at-risk animals.
- 9) **Treat for the recommended time period:** To minimize the potential for bacteria to become resistant to antimicrobials.
- 10) Avoid environmental contamination with antibiotics: Steps should be taken to minimize antimicrobials reaching the environment through spillage, contaminated ground run off or aerosolization.
- 11) Keep records of antibiotic use: Accurate records of treatment and outcome should be used to evaluate therapeutic regimens and always follow proper meat and milk withdrawal times. Keep records for a minimum of 2 years or longer based on state and local regulations.
- 12) **Follow label directions:** Follow label instructions and never use antibiotics other than as labeled without a valid veterinary prescription.

<sup>&</sup>lt;sup>52</sup>https://www.bqa.org/Media/BQA/Docs/bqa\_antibiotics\_final.pdf

- 13) Extra-label antibiotic use must follow FDA Regulations: Prescriptions, including extra label use of medications must meet the Animal Medicinal Drug Use Clarification Act (AMDUCA), amendments to the Food, Drug, and Cosmetic Act and its regulations. This includes having a valid VCPR.
- 14) Medically Important Antibiotic Use Should be Limited to Treat, Prevent or Control Disease: Medically important antibiotics should not be used if the principle intent is to improve performance. Antibiotics that are medically important to human medicine may not be used for performance.

Cattle producers have a moral and ethical responsibility to ensure, to the best of their ability, the health and well-being of the livestock in their care. Management programs that provide disease prevention practices, including the judicious use of antibiotics, are extremely important tools that ensure cattle health and well-being in the Cow-Calf Sector.

## PROVIDE FACILITIES THAT ALLOW SAFE AND HUMANE MOVEMENT AND/OR RESTRAINT OF LIVESTOCK

All cow-calf producers handle, move, and restrain their livestock as part of the production process. Welldesigned and maintained facilities provide a safe, humane, and efficient method to perform these operations. Cattle handling practices should be defined and communicated in compliance with the recommendations of the BQA program (BQA, 2015; Grandin, 2015; OIE, 2017). A conscientious producer should always be considerate of the amount of pressure being applied to cause cattle to move in a desired direction. Too much, or deliberately excessive, stimulation to cause desired movement can result in injury to cattle and/or humans, permanent attitude changes of the cattle toward the facilities and/or humans, and decreased performance such as weight gain or loss of pregnancy.

#### PROVIDE PERSONNEL WITH TRAINING TO PROPERLY HANDLE AND CARE FOR CATTLE

Management practices should be informally assessed every day to ensure that animal health and wellbeing are not compromised (BQA, 2015; Grandin, 2015). Regardless, producers are encouraged to implement a system to verify efforts directed at animal care and handling. This can be accomplished by:

- 1) Establishing a network of resources on cattle care
- 2) Following the <u>BQA Cattle Care and Handling Guidelines<sup>53</sup></u>
- 3) Recording training and educational activities to share as needed
- 4) Conducting self-assessments or external audits of animal care and handling procedures (selfassessment guides are available online at <u>www.bqa.org</u>)
- 5) <u>Participating in BQA training and certification programs<sup>54</sup></u>
- 6) Periodically conducting informal self-reviews by those involved with cattle feeding and care

Training people who are working with the animals, on BQA principles, is critical to animal health and wellbeing. Ensuring this training occurs is the responsibility of beef producers. Referencing the <u>Cow-Calf Sector</u> <u>Employee Safety and Well-being Indicator</u> for additional detail and resources on the importance of proper handling techniques to animal health. Other cattle industry sectors are also encouraged to implement systems to ensure training occurs.

#### PROVIDE APPROPRIATE TRANSPORTATION FOR THE CATTLE

The national BQA manual details cattle transportation guidelines, including:

<sup>53</sup>https://www.bqa.org/Media/BQA/Docs/cchg2015\_final.pdf

<sup>&</sup>lt;sup>54</sup>https://www.bqa.org/

- 1) Cattle sorting and holding pens should allow handling without undue stress, be located near the loading/unloading facility, and be suitable for herd size.
- 2) Properly designed and maintained loading facilities should be provided for easy and safe animal movement. Proper design of loading chutes, as well as personnel who are knowledgeable of the chutes' proper use, can assure the safety of both cattle and cattle handlers. Ramps and chutes should be strong and solid, provide nonslip footing, and have sides high enough to keep cattle from falling or jumping off. A ramp angle of 25 degrees or less will improve cattle movement.
- 3) All vehicles used to transport cattle should provide for the safety of personnel and cattle during loading, transporting, and unloading.
- 4) Strict adherence to safe load levels regarding animal weight and space allocation is critical.
- 5) Producers hauling cattle in farm and ranch trailers must ensure that adequate space is provided so that cattle have sufficient room to stand with little risk of being forced down because of overcrowding.
- 6) Cattle that are unable to withstand the rigors of transportation should not be shipped.
- 7) When a vehicle is not full, cattle should be safely partitioned into smaller areas to provide stability for the cattle and the vehicle.
- 8) Knowingly inflicting physical injury or unnecessary pain on cattle when loading, unloading, or transporting animals is not acceptable.
- 9) No gap that would allow injury to an animal should exist between the ramp, its sides, and the vehicle.
- 10) Vehicle doors and internal gates should be sufficiently wide to permit cattle to pass through easily without bruising or injury.

<u>Additional details can be found in the BQA Transportation Quality Assurance Program</u><sup>55</sup>. Also, the BQA Transportation (BQAT) online training is available <u>here</u><sup>56</sup>.

#### TOOLS AND INFORMATIONAL RESOURCES

The following resources can be helpful to producers seeking to improve their operations; it is not intended to be an exhaustive list. These tools are the result of years of scientific research and practical experience and are continually updated to provide the latest in animal management information and technologies. USRSB does not own or manage these resources, but they are provided as potential helpful tools for value chain participants.

- 1) American Association of Bovine Practitioners (AABP) Antibiotics Position Statement<sup>57</sup>
- 2) Antibiotics Resource Center National Cattlemen's Beef Association, producer resources 58
- 3) <u>BQA Manual<sup>59</sup></u>
- 4) <u>BQA Antibiotic Stewardship for Beef Producers guidelines<sup>60</sup></u>
- 5) <u>BQA transportation online training<sup>61</sup></u>

<sup>&</sup>lt;sup>55</sup>https://www.bqa.org/Media/BQA/Docs/master\_cattle\_transporter\_guide-digital.pdf

<sup>&</sup>lt;sup>56</sup>https://bqatransportation.beeflearningcenter.org/

<sup>&</sup>lt;sup>57</sup>http://www.aabp.org/Resources/AABP\_Guidelines/AABPrwaPSfinal.pdf

<sup>&</sup>lt;sup>58</sup>http://www.beefusa.org/producerresources.aspx

<sup>&</sup>lt;sup>59</sup> https://www.bqa.org/Media/BQA/Docs/nationalmanual.pdf

<sup>&</sup>lt;sup>60</sup>https://www.bqa.org/Media/BQA/Docs/bqa\_antibiotics\_final.pdf

<sup>&</sup>lt;sup>61</sup>https://bqatransportation.beeflearningcenter.org/

- 6) Framework for Antibiotic Stewardship in Food Animal Production<sup>62</sup>
- 7) State cattlemen's associations
- 8) State extension service specialists

## COW-CALF SECTOR SUSTAINABILITY ASSESSMENT GUIDE: INDICATOR 1.6: EMPLOYEE SAFETY AND WELL-BEING

METRIC 1.6: ARE ALL INDIVIDUALS WHO ARE INVOLVED IN THE OPERATION TRAINED IN STOCKMANSHIP AND SAFETY, AND ARE THEY IMPLEMENTING THESE PRACTICES ON THE FARM OR RANCH?

#### DESCRIPTION OF INDICATOR AND METRIC

**USRSB defines Employee Safety and Well-being as:** The implementation of safety programs and training to provide a safe workplace and help to prevent workplace accidents and injuries associated with production, processing, and distribution of beef and the relative prosperity of workers employed in those activities.

Adopting principles of good stockmanship and safety procedures on the ranch improves the safety and well-being of farm and ranch employees by reducing injury and allowing more confidence and pride to be cultivated in their work. In addition, trained employees using these practices reduce cattle stress and injuries, thereby improving the health and well-being of the animals. Moreover, cattle under low stress conditions and reduced injury risk perform better, improving the Efficiency and Yield Indicator by improving profitability for the cow-calf producer.

Training plays a key role in making sure everyone follows the same procedures for employee safety and well-being, as well as animal health and well-being. To that end, each operation should establish a safety and health program. A written safety and health program helps to mitigate any legal action resulting from an accident or injury. Importantly, on many farms and ranches, family members are the only "employees." Often, these family members have grown up with stockmanship principles as a part of their everyday routine. Nevertheless, stockmanship and safety should always be kept top of mind, with additional training sought whenever possible. Being safe is everyone's responsibility.

#### **GUIDANCE TO ACHIEVE THE METRIC**

Agricultural operations vary across the U.S., and thus, safety and health programs will vary by operation. However, there are elements that apply to any safety and health program. Every program should:

- 1) Establish safety policies and procedures
- 2) Identify risks and hazards
- 3) Eliminate, prevent, or control the hazards and risks
- 4) Participate in and document trainings
- 5) Evaluate effectiveness and outcomes of methods

<sup>&</sup>lt;sup>62</sup>https://www.pewtrusts.org/-/media/assets/2018/12/framework-for-antibiotic-stewardship-in-food-animal-production\_final2.pdf

The following is not intended as a template, checklist, or instruction for a safety and health program; rather, it presents some examples of the components of a strong program. Many agencies and institutions, both public and private, are available to assist producers in evaluating or developing a safety and health program (see <u>Tools and Informational Resources section</u> below). USRSB encourages producers to utilize outside expertise/consultants who can develop or aid in the development of a program.

#### 1) Establish safety policies and procedures

 Develop a written safety statement that represents the goals of the program. Safety policies and procedures should be written by an experienced owner/operator on the farm or ranch. Objectives and goals should be clearly outlined. A culture of safety starts at the top of the organization. All employees (including owners and managers) should be required to follow safety policies and procedures.

#### 2) Identify risks and hazards

Include controls for reducing or eliminating the hazards and/or adjusting the environmental conditions.

#### 3) Eliminate, prevent, or control the hazards and risks

- Proactively control hazards and reduce occupational injuries and illnesses.
  - i) Personal protective equipment (PPE) for each job and instructions on how to properly use appropriate PPE should be described.

#### 4) Participate in trainings

- Provide training to ensure workers feel comfortable performing safe work procedures on the farm or ranch.
  - i) Repeat training; frequency of training is needed to master new skills and override unsafe habits.
  - ii) Complete training before any new employee starts working, even if they have performed the same job at another place of employment.
  - iii) Participate in trainings on a regular basis to keep safe and healthy work practices relevant to workers.
  - iv) Consider general bi-annual trainings and monthly safety talks for seasonally relevant issues; for training to be effective it needs to be designed for, and consider these characteristics of, adult learners:
    - (1) Self-directed
    - (2) Want to use personal experience
    - (3) Relevant and practical
    - (4) Goal-oriented
    - (5) Problem-oriented
    - (6) Short on time
    - (7) Motivated by intrinsic and extrinsic factor

#### 5) Evaluate

- Perform an evaluation to measure the effectiveness of efforts
- Determine if changes or additions should be made to enhance the training

#### 6) Safety Program Guidelines

- Outline clearly the responsibilities for each role on the farm or ranch
- Identify general safety rules
- Have accountability procedures in place
- Provide the program in every language that is spoken at the farm or ranch
- Involve the workers in the development of the safety guidelines

- Ensure the owners and managers abide by the safety guidelines and set a good example for the employees
- Monitor and enforce the safety guidelines
- Include emergency response instructions in the guidelines
- Require owners and managers to be certified in CPR and first aid
- Evaluate the training to determine effectiveness
  - i) Different methods and tools can be used including:
    - (1) Observation observe employees after the training is completed
    - (2) Administer pre- and post-tests before and after training to assess workers' comprehension of the covered material

The following are analysis options for employers, that can provide insight to potential hazards associated with the job and control strategies for those hazards to further inform an employee safety and well-being program.

#### 1) Job Safety Analysis

- A job safety analysis (JSA), is a written analysis of potential hazards associated with every step of a job. A JSA includes ways to eliminate, minimize, or control the hazard, and it can be used as a training resource for new employees. A JSA can help improve the efficiency of the jobs on a farm or ranch and encourage teamwork and hazard awareness.
- The first task is selecting the job and listing the individual steps for this job (each step should accomplish a task). The next task is identifying the hazards within the job steps. A good rule of thumb is to ask, "How can I get hurt doing this step of the job?" Next, come up with solutions and recommendations on how to control or eliminate the hazard. Be specific and don't forget to list personal protective equipment.

#### 2) Hierarchy of Hazard Control

The hierarchy of hazard control is a system used to minimize or eliminate hazards (Figure 5).
 Hazard control strategies are listed in order of decreasing effectiveness. The most effective options are located on the top of the inverted triangle and the least effective methods are on the bottom. A combination of the approaches can be implemented.





Expanding the number of cow-calf producers in the U.S. who implement a training program for all individuals involved in the operation and implement practices regarding stockmanship and safety on the farm or ranch will enhance the safety of the workplace and help prevent workplace accidents and injuries associated with production, processing, and distribution of beef.

Further, it will support and protect the relative prosperity of workers employed in those activities. These improvements will be supported by increasing producer knowledge and adoption of the practices described in this SAG. Benchmarking the number of producers across the U.S. who currently have implemented a safety and management plan that addresses worker safety will provide the basis for setting goals for expanding adoption rates in the future.

#### TOOLS AND INFORMATIONAL RESOURCES

The following resources can be helpful to producers seeking to improve their operations; it is not intended to be an exhaustive list. USRSB does not own or manage these resources, but they are provided as potential helpful tools for value chain participants.

- 1) <u>Beef Cattle Institute Animal Care Training<sup>63</sup></u>
- 2) <u>Beef Quality Assurance<sup>64</sup></u>

<sup>&</sup>lt;sup>63</sup>https://www.animalcaretraining.org/index.aspx

<sup>64</sup>https://www.bqa.org/

- Southwest Center for Agricultural Health, Injury Prevention, and Education Agricultural Safety <u>Resources<sup>65</sup></u>
- 4) <u>Stockmanship and Stewardship<sup>66</sup></u>

#### REFERENCES

- AABP. 2013a. Practical Euthanasia of Cattle. *Association of Bovine Practitioners*. (2013). Retrieved from <u>http://www.aabp.org/resources/AABP\_Guidelines/Practical\_Euthanasia\_of\_Cattle-</u> <u>September\_2013.pdf</u>.
- AABP. 2013b. Establishing and Maintaining the Veterinarian-Client-Patient Relationship in Bovine Practice. *American Association of Bovine Practitioners.* (2013). Retrieved from <u>http://www.aabp.org/resources/aabp\_guidelines/vcprguidelinefinal11-2013.2.pdf</u>.
- AABP. 2013c. Prudent Antimicrobial Use Guidelines for Cattle. *Association of Bovine Practitioners.* (2013). Retrieved from

http://www.aabp.org/resources/aabp\_guidelines/AABP\_Prudent\_Antimicrobial\_Use\_Guidelines-2013.pdf.

- Asem-Hiablie, S., T. Battagliese, K. R. Stackhouse-Lawson, and C. A. Rotz. (2018). A life cycle assessment of the environmental impacts of a beef system in the USA. *International Journal of Life Cycle Assess*. Retrieved from <a href="https://doi.org/10.1007/s11367-018-1464-6">https://doi.org/10.1007/s11367-018-1464-6</a>
- BQA. 2015. Cattle Care and Handling Guidelines. Beef Quality Assurance. (2015). Retrieved from bqa.org.
- BQA. 2014. Supplemental Guidelines. *Beef Quality Assurance*. (2014). Retrieved from <u>http://www.bqa.org/media/bqa/docs/supplemental\_guidelines\_2014.pdf</u>.
- Briske, D.D., J.D. Derner, D.G. Milchunas, and K.W. Tate. (2011). Chapter 1: An evidence-based assessment of prescribed grazing practices. Conservation Benefits of Rangeland Practices: Assessment, Recommendations, and Knowledge Gaps. *United States Department of Agriculture, Natural Resources Conservation Service.*
- DelCurto, T., M. Porath, C.T. Parsons, and J.A. Morrison. (2005). Invited Synthesis Paper: Management Strategies for Sustainable Beef Cattle Grazing on Forested Rangelands in the Pacific Northwest. *Rangeland Ecology & Management.* 58, pp 119-127. Paper presented at the 2003 Annual Meeting of the Society for Range Management, Casper, WY.
- Dewell, R. D., G. A. Dewell, D. A. Bear, W. Weber, D. D. Griffin, and E. W. Rowe. (2016). Description and Justification of a Consistent Technique for Euthanasia of Bovines Using Firearm and Penetrating Captive Bolt. *The Bovine Practitioner*. (Vol. 50(2), pp 190-195).
- Farney, J. K., D. A. Blasi, S. Johnson, C. Reinhardt, A. J. Tarpoff, J. Waggoner, and R. Weaber. (2016). Guide to Body Condition Scoring Beef Cows and Bulls. *Kansas State University. Publication # MF 3274*. Retrieved from <u>https://www.bookstore.ksre.ksu.edu/pubs/MF3274.pdf</u>.
- Franzluebbers, A.J., J.A. Stuedemann, H.H. Schomberg, and S.R. Wilkinson. (2000). Soil organic C and N pools under long-term pasture management in the Southern Piedmont USA. *Soil Biology & Biochemistry*. (Vol. 32, pp 469-478).
- Gadberry, S. (2013). Feeding Beef Cows Based on Body Condition Scores. University of Arkansas, Division of Agriculture Research & Extension. Publication # MP373. Retrieved from https://www.uaex.edu/publications/pdf/MP373.pdf.

 <sup>&</sup>lt;sup>65</sup>https://www.uthealth.org/southwest-center-agricultural-health-injury-prevention-education/agricultural-safety-resources
 <sup>66</sup>https://www.stockmanshipandstewardship.org/

Goetting, M.A., S.M Danes, V. Knerr, C. Leifeld, G. Bradshaw. (2016). Transferring Your Farm or Ranch to the Next Generation. *Montana State University Extension Publication EB0149*, pp 20.

- Grandin, T. (2015). Ch. 1 An Introduction to Implementing an Effective Animal Welfare Program Improving Animal Welfare, A Practical Approach: Second Edition. Colorado State University.
- Hamilton, S., C. Garretson-Weibel, J.E. Mitchell, M. Smith, D. Powell, C. Quimby, G. Fults, C. Stanley, J.
   Tanaka, K.A. Maczko, J.K. Brite, Jr., D. Loper, N. Hansen, L.D. Bryant. (2011). Sustainable Ranch
   Management Assessment Guidebook. *Sustainable Rangelands Roundtable Publication No. 4*. Pp76.
   University of Wyoming Cooperative Extension Service. B-216. Laramie, WY.
- Hristov, A.N., J. Oh, J. L. Firkins, J. Dijkstra, E. Kebreab, G. Waghorn, H. P. S. Makkar, A. T. Adesogan, W.
   Yand, C. Lee, P. J. Gerber, B. Henderson, and J. M. Tricarico. (2013). SPECIAL TOPICS Mitigation of methane and nitrous oxide emissions from animal operation: I. A review of enteric methane mitigation options. *Journal of Animal Science*. (Vol 91 pp 5045-506).
- Hubbard, R.K., Newton, G.L. and Hill, G.M., (2004). Water Quality and The Grazing Animal. *Journal of Animal Science*. Retrieved from http://digitalcommons.unl.edu/usdaarsfacpub/274.
- Knutson, C. and T. Haigh. (2013). A drought-planning methodology for ranchers in the Great Plains. *Society* of Range Management. 35, pp27-33. Retrieved from <u>http://rangelandwatersheds.ucdavis.edu/DroughtInformation/A%20Drought-</u> <u>Planning%20Methodology%20for%20Ranchers%20in%20the%20Great%20Plains.pdf</u>
- LucionServices. 2015. The Hierarchy of hazard control explained. *LucionServices*. (2015). Retrieved from <a href="http://www.lucionservices.com/the-hierarchy-of-hazard-control-explained/">http://www.lucionservices.com/the-hierarchy-of-hazard-control-explained/</a>
- Maczko, K.A., J. A. Tanaka, R. Breckenridge, L. Hidinger, H. T. Heintz, W.E. Fox, U.P. Kreuter, C.S. Duke, J.E. Mitchell, and D.W. McCollum. (2011). Rangeland Ecosystem Goods and Services: Values and Evaluation of Opportunities for Ranchers and Land Managers. Rangelands 33(5): 30-36.
- Maczko, K.A., J.A. Tanaka, M. Smith, C. Garretson-Weibel, S.F. Hamilton, J.E. Mitchell, G. Fults, C. Stanley,
   D. Loper, L.D. Bryant, and J. K. Brite, Jr. (2012). Ranch Business Planning and Resource Monitoring for Rangeland Sustainability. *Society of Range Management*. pp 11-18.
- Montes, F., R. Meinen, C. Dell, A. Rotz, A. N. Hristov, J. Oh, G. Waghorn, P. J. Gerber, B. Henderson, H. P. S. Dijkstra. (2013). SPECIAL TOPICS Mitigation of methane and nitrous oxide emissions from animal operations: II. A review of manure management mitigation options. *Journal of Animal Science*. (Vol. 91, pp5070-5094).
- NRC. 2016. Nutrient Requirements of Beef Cattle: Eighth Revised Edition. *National Research Council. National Academies of Sciences, Engineering, and Medicine*. (2016). Washington, DC: The National Academies Press. Retrieved from <u>https://www.nap.edu/catalog/19014/nutrient-requirements-of-</u> beef-cattle-eighth-revised-edition.
- OIE. 2017. Terrestrial Animal Health Code, Animal Welfare and Beef Cattle Production Systems, Chapter 7.9. *World Organization for Animal Health. Sustainability Assessment Guide*. (2017). Retrieved from <a href="http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre\_aw\_beef\_catthe.htm">http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre\_aw\_beef\_catthe.htm</a>.
- Sollenberger, L.E., C.T. Agouridis, E.S. Vanzant, A.J. Franzluebbers, and L.B. Owens. (2012). Chapter 3: Prescribed Grazing on Pasturelands. *Conservation Outcomes from Pastureland and Hayland Practices: Assessment, Recommendations, and Knowledge Gaps*. Ed. C.J. Nelson. Allen Press, Lawrence, KS.
- Spangler, M.L. (2015). Economically relevant traits and selection indices. *Proceedings of the 24<sup>th</sup> Range Beef Cow Symposium.* Retrieved from

http://www.rangebeefcow.com/2015/proceedings/09Spangler\_109-115.pdf

- Stewart, L. and T.G. Dyer. (2017). Reproductive Management of Commercial Beef Cows. *University of Georgia Extension*. Retrieved from http://extension.uga.edu/publications/detail.html?number=B864
- Teague., W.R., S.L. Dowhower., S.A. Baker., N. Haile., P.B. DeLaune., D.M. Conover. (2011). Grazing management impacts on vegetation, soil biota and soil chemical, physical and hydrological properties in tall grass prairie. *Agriculture, Ecosystems & Environment*. (Volume 141, Issues 3–4, pp 310-322)
- The Beef Checkoff (2006). Fact Sheet: Animal Welfare in Cattle Production. *Beef Board Organization*. Retrieved from <u>beefboard@beefboard.org</u>.
- Tolleson, D. R. (2017). An easy to use system for developing a drought management contingency plan. *Arizona Cooperative Extension*. Retrieved from <u>https://extension.arizona.edu/sites/extension.arizona.edu/files/pubs/az1725-2017.pdf</u>
- USDA. 2012. Census of Agriculture, Table 12 Cattle and Calves. U.S. Department of Agriculture. (2012). [Data file]. Retrieved from

https://www.nass.usda.gov/Publications/AgCensus/2012/Full\_Report/Volume\_1,\_Chapter\_1\_US/

# U.S. BEEF INDUSTRY SUSTAINABILITY FRAMEWORK: 2. AUCTION MARKET SECTOR

OVERVIEW OF THE LIVESTOCK AUCTION SECTOR	46
AUCTION MARKET SECTOR SUSTAINABILITY ASSESSMENT GUIDES (SAG)	47
SAG FOR INDICATOR 2.1 WATER RESOURCES	
Metric 2.1	
Description of Indicator and Metric	
Guidance to Achieve the Metric	
Tools and Informational Resources	49
SAG FOR INDICATOR 2.2 LAND RESOURCES	49
Description of Indicator and Metric	49
SAG FOR INDICATOR 2.3 AIR AND GREENHOUSE GAS EMISSIONS	50
Description of Indicator and Metric	50
SAG FOR INDICATOR 2.4 EFFICIENCY AND YIELD	50
Description of Indicator and Metric	50
SAG FOR INDICATOR 2.5 ANIMAL HEALTH AND WELL-BEING	51
Metric 2.5	51
Description of Indicator and Metric	51
Guidance to Achieve the Metric	52
Provide Appropriate Transportation for the Cattle	54
Tools and Informational Resources	54
SAG FOR INDICATOR 2.6 EMPLOYEE SAFETY AND WELL-BEING	55
Metric 2.6	55
Description of Indicator and Metric	55
Guidance to Achieve the Metric	55
Tools and Informational Resources	56
REFERENCES	

## **OVERVIEW OF LIVESTOCK AUCTION MARKET SECTOR**

Livestock auction markets act as an agent, facilitating a sales transaction between livestock buyers and sellers. Many different species are sold through auction markets, including cattle, sheep, and hogs. Some markets may also sell horses, small animals, and poultry.

There are about 1,000 auction markets in the U.S., with a heavy concentration in the Midwest, Plains, and Southeast regions. These markets accommodate producers with herds and consignments of all sizes.

Approximately 80% of cattle producers market their cattle at an auction market each year, for a total of 31 million head of cattle sold annually through auction markets. In contrast, there are seven million head of

hogs and three million head of sheep sold at auction markets annually. The total auction market industry accounts for more than \$40 billion dollars in livestock sold each year (GIPSA, 2018).

Livestock auction markets sell livestock at all stages of life. For example, a producer will market cattle based on the structure of his or her operation. A cow-calf producer could sell calves through an auction market, with the buyer being another producer who will grow the calves to a size appropriate for finishing at a feedyard. Likewise, a producer could market finished cattle to packers for slaughter, through an auction market.

## AUCTION MARKET SECTOR SUSTAINABILITY ASSESSMENT GUIDES

Recognizing that cattle only spend a very brief time (usually 48 hours, almost always less than a week) in the care of auction markets, the auction impact on Water Resources, Animal Health and Well-being, and Employee Safety and Well-being Indicators can still be substantial. Conversely, the Auction Market Sector generally has less impact on Efficiency and Yield, Air and Greenhouse Gas Emissions, and Land Resources Indicators and their sustainability outcomes. While metrics may emerge for these latter high-priority indicators for the Auction Market Sector in the future, the ability of auctions to drive improvement across those indicators is limited. Thus, the Auction Market Sector has focused efforts on the three indicators in which they have the greatest impact: Water Resources, Animal Health and Well-being, and Employee Safety and Well-being.

Information presented in the Auction Market Sector Sustainability Assessment Guides (SAGs) will assist in the adoption and implementation of the three targeted high-priority indicators with supporting documents, guidance, resources, and best practices identified by USRSB members and supporting industries.

The content and resources listed in the guidance that accompanies the target indicators and their metrics are intended to be used only as suggestions for auctions owners/operators striving for continuous improvement in these areas. The resources should not be interpreted as standards that would determine how the respondent should answer each question.

The following SAGs describe and define the metrics for each of the six high-priority sustainability indicators. The SAGs also include resources and tools which will assist individual operators in assessing their own operations and identifying and implementing opportunities for improvement as it relates to the sustainability indicators. Importantly, adoption and use of the methods and tools described in the SAGs is voluntary. The SAGs are primarily intended to assist operators in improving a wide range of outcomes on their operations over time.

For each of the six high-priority indicators, the SAG will include:

- 1) A description of the indicator to ensure a clear understanding of its intent
- 2) A description of the metric selected to measure the indicator
- 3) Supporting guidelines that elaborate on the context of the metric, including guidelines to address various elements of the metric
  - It is important to note:
    - i) Individual operators may or may not be addressing all the items asked in the supporting guidelines for a particular metric
    - ii) Knowing what some of these additional elements are creates the opportunity for that operator to consider addressing those items going forward
    - iii) Action on the part of the operator to address the listed items, or other items, over time is a means of demonstrating continuous improvement

- 4) Resources for implementation (not meant to be an exhaustive list), including:
  - Recommended practices for improving a particular metric
  - Summary of existing information for that metric
  - Tools (software, apps, hardware, etc.), for supporting metric assessment
  - Case studies
  - Technical support information
- 5) Suggested methods to monitor change and/or progress over time

A key tenet of sustainability is managing any operational task to strive toward **continuous improvement.** As this self-assessment is worked through on an operation, the guidelines below should be considered, and implementation planned in accordance with individual operation environments, situations, and needs. Methods to monitor change and/or progress over time also need to be identified. Incorporating guidelines, such as those identified in this SAG, into routine process reviews will potentially improve both the efficiency and sustainability of the operation.

## AUCTION MARKET SECTOR SUSTAINABILITY ASSESSMENT GUIDE: INDICATOR 2.1: WATER RESOURCES

# METRIC 2.1: ARE WATER RESOURCE MANAGEMENT STRATEGIES IMPLEMENTED AT THE AUCTION THAT ADDRESS WATER MANAGEMENT, WATER USE OPTIMIZATION / CONSERVATION AND WATER QUALITY?

#### DESCRIPTION OF INDICATOR AND METRIC

**USRSB defines Water Resources as:** The volume of water used by a sector for each process, and any impacts on water quality by a sector for each process.

For the Auction Market Sector, the Water Resources Metric focuses on water management, water use optimization/conservation, and water quality. The adoption of a water resource management strategy is recommended. A water resource management strategy for auctions impacts both water quantity and quality. Water resource management strategies allow the auction to monitor and put measures in place to optimize the usage of water, protect surface and groundwater quality, and utilize water wisely as a heat or dust control measure, as well as to maintain and provide an adequate supply of clean water to animals.

#### **GUIDANCE TO ACHIEVE THE METRIC**

Answering the following questions will assist auction operators in highlighting areas that are currently well managed and areas that can be improved, as well as helping develop an understanding of the current state of the Water Resources Indicator, at the auction, to facilitate continuous improvement in this indicator.

- 1) Is the auction a member of a local groundwater or surface water management district?
- 2) Is the auction fully implementing groundwater or surface water management district regulations?
- 3) Has the auction eliminated water waste?
- 4) Are water leaks repaired quickly?
- 5) Is water use reviewed regularly, and are any major deviations from the historical mean analyzed to determine the cause?
- 6) Does the auction facility have a flush system?

- 7) Do livestock have access to surface waters such as ditches, drains, creeks, rivers, or lakes?
- 8) Does the auction facility have an evaporation pond or wastewater holding area?
- 9) Are pens and other surfaces being scraped/cleaned regularly?
- 10) Has the auction developed a nutrient management plan (NMP) or strategy to address the proper production, collection, storage, and beneficial use of manure and process wastewater?
- 11) Are water quality measures being implemented in accordance with permit or other voluntary program requirements?
- 12) Has the auction identified all potential pollutant sources and established measures to prevent water quality impacts?
- 13) Is there a pond to store runoff water from the corrals and manure storage areas?
- 14) Is the retention pond(s) structurally sound with no cracks or leaks?
- 15) Are animal mortalities handled in accordance with state regulations composted, buried, rendered?
- 16) Are employees with environmental management responsibilities trained at least annually?

#### TOOLS AND INFORMATIONAL RESOURCES

The following resources can be helpful to those seeking to improve their operations; it is not intended to be an exhaustive list. USRSB does not own or manage these resources, but they are provided as potential helpful tools for value chain participants.

- 1) Commercial services
  - <u>AGPROfessionals<sup>67</sup></u>
  - <u>Enviro-Ag<sup>68</sup></u>
  - <u>Terracon<sup>69</sup></u>
- 2) Land grant universities and extension services
  - <u>Land Application Assessment tool</u><sup>70</sup>
  - Land Application Methods to Reduce Odors and Emissions<sup>71</sup>
  - Whole Farm Nutrient Balance tool<sup>72</sup>
- 3) Livestock Marketing Association<sup>73</sup>
- 4) State cattlemen's associations environmental services
- 5) State or district water boards

State and region-specific resources are regularly updated online at <u>www.beefsustainability.us</u>.

## AUCTION MARKET SECTOR SUSTAINABILITY ASSESSMENT GUIDE: INDICATOR 2.2: LAND RESOURCES

#### **DESCRIPTION OF INDICATOR AND METRIC**

<sup>&</sup>lt;sup>67</sup>https://www.agpros.com/

<sup>68</sup>https://www.enviroag.com/

<sup>69</sup>https://www.terracon.com/

<sup>&</sup>lt;sup>70</sup>http://nmplanner.missouri.edu/tools/agsite.asp

<sup>&</sup>lt;sup>71</sup>http://www.agronext.iastate.edu/ampat/landapplication/am/homepage.html

<sup>&</sup>lt;sup>72</sup>https://articles.extension.org/pages/8948/whole-farm-nutrient-balance

<sup>&</sup>lt;sup>73</sup>https://lmaweb.com/

**USRSB defines Land Resources as**: The stewardship of terrestrial and aquatic habitats in relation to water, soil, biodiversity, impacts of land use, and land use conversion caused by and prevented by ranching and farming activities and other value-chain land use decisions.

Auctions with federal permits are required to have a NMP and implement such plan, subject to criminal and civil sanctions for any violations. Recordkeeping is also part of this type of NMP. A majority of auctions are not subject to federal permits due to the limited land footprint and limited number of days per year, or annual head handled, by the auction.

It is recommended that auctions utilize available resources to form an NMP or strategy. Land grant universities and extension services across the country have developed these resources, including <u>lowa</u> <u>State University's Beef Feedlot Systems Manual</u><sup>74</sup>, which provides guidance on housing and floor structures, manure handling and storage, and proper application of manure. Similar resources can be found at the University of Nebraska, Kansas State University, Texas A&M University, other universities, and government agencies such as the <u>USDA Natural Resource Conservation Service</u><sup>75</sup> (NRCS).

Based on the limited number of auctions that have a land resource footprint to the extent of other beef cattle sectors, the auctions will maintain their initial focus on the sustainability indicators for Animal Health and Well-being, Water Resources, and Employee Safety and Well-being.

## AUCTION MARKET SECTOR SUSTAINABILITY ASSESSMENT GUIDE: INDICATOR 2.3: AIR AND GREENHOUSE GAS EMISSIONS

#### DESCRIPTION OF INDICATOR AND METRIC

**USRSB defines Air and Greenhouse Gas Emissions as:** The cumulative emissions of pollutants, including particulate matter, greenhouse gases, and other gaseous emissions from a sector for each process.

Cattle only spend a very brief time (usually 48 hours, almost always less than a week), in the care of auction markets. Therefore, it is observed that overall impact on air and greenhouse gas emissions would be minimal.

Auctions should recognize that other indicators and metrics may have a secondary supporting impact on the Air and Greenhouse Gas Emissions Indicator, and thus, the initial focus of auction markets will be on the Animal Health and Well-being, Water Resources, and Employee Safety and Well-being Indicators.

## AUCTION MARKET SECTOR SUSTAINABILITY ASSESSMENT GUIDE: INDICATOR 2.4: EFFICIENCY AND YIELD

#### DESCRIPTION OF INDICATOR AND METRIC

**USRSB defines Efficiency and Yield as:** 1) Efficiency is expressed as the unit of input required to produce a unit of output, and 2) Yield is the total product generated per unit of time or space. Both concepts address waste as a negative characteristic and drive toward improved profitability.

<sup>&</sup>lt;sup>74</sup>https://store.extension.iastate.edu/Product/Beef-Feedlot-Systems-Manual-PDF

<sup>&</sup>lt;sup>75</sup>https://www.nrcs.usda.gov/wps/portal/nrcs/site/national/home/

A variety of components regarding cattle performance and operational efficiency are routinely monitored to evaluate efficiency and yield in beef production. Average daily gain and animal health are among these factors. Auctions serve as the conduit between the Cow-Calf Sector and those farther up the chain (backgrounders, stockers, feedyards, packers/processors). Due to this and the typically minimal time an animal stays at the auction yard, auctions have minimal impact on the efficiency and yield of beef cattle.

Auctions should recognize that other indicators and metrics may have a secondary supporting impact on the Efficiency and Yield Indicator and thus the initial focus of auction markets will be on the Animal Health and Well-being, Water Resources, and Employee Safety and Well-being Indicators.

## AUCTION MARKET SECTOR SUSTAINABILITY ASSESSMENT GUIDE: INDICATOR 2.5 ANIMAL HEALTH AND WELL-BEING

METRIC 2.5: ARE EMPLOYEES TRAINED AND AUCTION-SPECIFIC BEEF QUALITY ASSURANCE (BQA) PRINCIPLES BEING IMPLEMENTED AT THE AUCTION MARKET?

#### DESCRIPTION OF INDICATOR AND METRIC

**USRSB defines Animal Health and Well-being as**: The cumulative effects of cattle health, nutrition, care and comfort.

The <u>Beef Quality Assurance (BQA) program</u><sup>26</sup> and its accompanying guidelines cover the major areas of animal nutrition, health, care, and handling. Adaption of these scientifically based (Grandin, 2016; Grandin, 2015) practices allow the beef value chain to produce healthier cattle with the least stress levels, which has a significant impact on the Animal Health and Well-being Indicator. These practices also align with the World Organization for Animal Health (OIE) code, which provides global standards for animal well-being and beef cattle production systems (OIE, 2017). Moreover, these practices also have an impact on the Employee Safety and Well-being Indicator by advancing low-stress, safe handling techniques and thereby reducing the risk of injury to employees. The BQA practices also have a secondary impact on the Efficiency and Yield Indicator by allowing the animal to perform at a higher level, thereby increasing profitability.

For the Auction Market Sector, the Livestock Marketing Association (LMA) recommends the use of the LMA Guide to Animal Handling and Employee Training<sup>77</sup> which, rooted in BQA principles, adapts the principles to the unique handling challenges of an auction market environment. The LMA Guide is recognized in the industry for its effort to provide training to auction market employees around animal care and handling. Online training and certification modules are available through the <u>Beef Cattle Institute</u> at Kansas State University<sup>78</sup> and available in offline training for LMA member auctions. In addition, LMA member auctions are required to participate in second-party assessments of handling guidelines and employee safety practices, with the additional opportunity for third-party voluntary assessments. Currently 5% of LMA member auctions complete annual third-party assessments (LMA, 2018).

<sup>&</sup>lt;sup>76</sup>https://www.bqa.org/Media/BQA/Docs/nationalmanual.pdf

<sup>&</sup>lt;sup>77</sup>http://www.Imaweb.com/

<sup>&</sup>lt;sup>78</sup>https://ksubci.org/

It is important to note that the primary step for this indicator is the implementation of auction-specific BQA principles, which the metric adequately recognizes. Whether or not a BQA, LMA, or equivalent certification is done, improvements in sustainability inevitably come from the implementation of the BQA principles. The assessment is extremely important, but only to inform and allow changes or new implementation of BQA principles at the auction.

#### **GUIDANCE TO ACHIEVE THE METRIC**

Answering the following questions will assist auction operators in highlighting areas that are currently well managed and areas that can be improved, as well as helping develop an understanding of the current state of the Animal Health and Well-being Indicator, at the auction, to facilitate continuous improvement in this indicator.

- 1) Are training and management practices in place to prohibit animal abuse or neglect?
  - The U.S. beef industry has zero tolerance for animal abuse. All employees must understand and practice proper animal handling techniques, always.
- 2) Are employees trained in auction-specific BQA principles?
  - Training is available for auction employees via offline training with the <u>Livestock Marketing</u> <u>Association<sup>79</sup></u> and via <u>Beef Quality Assurance<sup>80</sup></u>.
- 3) Is euthanasia protocol established and followed?
  - Referenced in the BQA manual, an excellent resource to assist in developing a euthanasia protocol can be found in the <u>Practical Euthanasia of Cattle Guidelines<sup>81</sup></u>, developed and published by the American Association of Bovine Practitioners.
- 4) Is a non-ambulatory animal handling protocol established and followed?
  - Employees must be trained in the proper ways to handle cattle in various situations to prevent stress and improve well-being of the cattle. These principles are covered under the LMA Guide and the BQA program.
- 5) Are water and feed readily available for all animals housed for more than 24 hours and as conditions require?
  - Cattle should be provided with the resources needed to be comfortable, healthy, and content, considering that cattle needs can vary depending on season and weather.
- 6) Are measures in place to prevent animals being marketed with a violative residue?
  - Cattle producers are prohibited by federal law from sending an animal to slaughter that has not reached the withdrawal period established for the specific medication that it may have received. In support of this effort, accurate and thorough recordkeeping is essential. Auction owners are asked through several business-to-business agreements to review the Repeat Residue Violators Report and declare any livestock consigned by an individual or entity listed on that report. Further protocols to achieve this are covered under the <u>BQA program<sup>82</sup></u>.
- 7) Is a biosecurity protocol for the facility established and followed?
  - Biosecurity is a set of practices employed to prevent the importation of infectious organisms into a herd or flock, or their transmission between animals. <u>Penn State Extension<sup>83</sup></u>, <u>University of</u>

<sup>&</sup>lt;sup>79</sup>http://www.lmaweb.com/

<sup>&</sup>lt;sup>80</sup>http://www.bqa.org/

<sup>&</sup>lt;sup>81</sup>http://www.aabp.org/resources/AABP\_Guidelines/Practical\_Euthanasia\_of\_Cattle-September\_2013.pdf

<sup>82</sup>http://www.bqa.org/

<sup>&</sup>lt;sup>83</sup>https://extension.psu.edu/biosecurity-a-practical-approach

<u>Tennessee</u><sup>84</sup>, and <u>USDA-APHIS</u><sup>85</sup> provide some resources and guidelines on biosecurity protocols and how to develop one.

- 8) Is a carcass disposal and removal protocol established and followed?
  - Proper carcass disposal has an impact on overall biosecurity and disease control. A protocol should include procedures for employees to follow in reporting carcasses to auction management, for moving carcasses to an area away from live animals and covering carcasses until proper disposal is completed.
- 9) Is protocol established and employees trained on minimizing the use of electric prods when handling cattle?
  - Under desirable conditions, cattle should flow through cattle handling systems without the use of electric prods. For safety and well-being reasons, facilities should minimize the use of electric prods. Non-electric driving aids, such as plastic paddles, sorting sticks, flags, or streamers (affixed to long handles) should be used to quietly guide and turn animals. When cattle continuously balk, handlers should investigate and correct the reason for the balking rather than resort to overuse of electric prods.
- 10) Are floor surfaces monitored and maintained to minimize the risk of slipping, stumbling, and falling by cattle in handling areas?
  - This is not only important for the cattle moving through a facility but also for the employees working in the facility. Good traction on wet/slippery surfaces is an important safety consideration.

#### 11) Are low-stress cattle handling techniques practiced?

- Cattle are naturally prey animals that react in unique ways to various handling techniques that may seem counterintuitive to people unfamiliar with their natural instincts. Employees should be trained on how to properly handle cattle in a way that positively optimizes their natural instincts. This training is available through the <u>BQA program<sup>86</sup></u>.
- 12) Are equipment, pens, gates, and chutes, etc. monitored and repaired when any potential injurycausing issue is detected?

#### 13) Do cattle in all overnight pens have space to lie down?

- Pen stocking rates for overnight pens should also be adjusted according to factors such as heat or animal condition.
- Cattle should have sufficient space in their pens for not only safety, but comfort. Comfortable cattle will practice normal behaviors such as eating and drinking regularly, chewing their cud, resting, and socializing with other animals. These factors have a significant impact on animal health and well-being.

#### 14) Do cattle in all sale pens have room to stand with heads down?

- Pen stocking rates for sale pens should also be adjusted according to factors such as heat or animal condition.
- 15) Are pens managed to minimize mud?
- 16) Are water tanks managed to provide clean, fresh water when cattle are present?
- 17) Are hay bunks managed to minimize mold, manure, or debris when cattle are present?

<sup>84</sup> https://extension.tennessee.edu/publications/Documents/SP604.pdf

<sup>&</sup>lt;sup>85</sup>https://www.aphis.usda.gov/animal\_health/emergency\_management/downloads/documents\_manuals/cowcalf\_industrymanual.pdf

<sup>86</sup>http://www.bqa.org/

#### PROVIDE APPROPRIATE TRANSPORTATION FOR THE CATTLE

The national BQA manual details cattle transportation guidelines, including:

- 1) Cattle sorting and holding pens should allow handling without undue stress, be located near the loading/unloading facility, and be suitable for herd size.
- 2) Properly designed and maintained loading facilities should be provided for easy and safe animal movement. Proper design of loading chutes, as well as personnel who are knowledgeable of the chutes' proper use, can assure the safety of both cattle and cattle handlers. Ramps and chutes should be strong and solid, provide nonslip footing, and have sides high enough to keep cattle from falling or jumping off. A ramp angle of 25 degrees or less will improve cattle movement.
- 3) All vehicles used to transport cattle should provide for the safety of personnel and cattle during loading, transporting, and unloading.
- 4) Strict adherence to safe load levels regarding animal weight and space allocation is critical.
- 5) Producers hauling cattle in farm and ranch trailers must ensure that adequate space is provided so that cattle have sufficient room to stand with little risk of being forced down because of overcrowding.
- 6) Cattle that are unable to withstand the rigors of transportation should not be shipped.
- 7) When a vehicle is not full, cattle should be safely partitioned into smaller areas to provide stability for the cattle and the vehicle.
- 8) Knowingly inflicting physical injury or unnecessary pain on cattle when loading, unloading, or transporting animals is not acceptable.
- 9) No gap that would allow injury to an animal should exist between the ramp, its sides, and the vehicle.
- 10) Vehicle doors and internal gates should be sufficiently wide to permit cattle to pass through easily without bruising or injury.

Additional details can be found in the BQA Transportation (BQAT) Quality Assurance Program<sup>87</sup>. Also, BQAT online training is available <u>here<sup>88</sup></u>.

#### TOOLS AND INFORMATIONAL RESOURCES

The following resources can be helpful to those seeking to improve their operations; it is not intended to be an exhaustive list. USRSB does not own or manage these resources, but they are provided as potential helpful tools for value chain participants.

- 1) Beef Cattle Institute at Kansas State University<sup>89</sup>
- 2) <u>Beef Quality Assurance<sup>90</sup></u>
- 3) Land grant universities and extension services
- 4) Livestock Marketing Association<sup>91</sup>
- 5) <u>Penn State Extension<sup>92</sup></u>
- 6) <u>Practical Euthanasia of Cattle Guidelines</u><sup>93</sup>

<sup>89</sup>https://ksubci.org/

 <sup>&</sup>lt;sup>87</sup>https://www.bqa.org/Media/BQA/Docs/master\_cattle\_transporter\_guide-digital.pdf
 <sup>88</sup>https://bqatransportation.beeflearningcenter.org/

<sup>&</sup>lt;sup>90</sup>http://www.bga.org/

<sup>&</sup>lt;sup>91</sup>https://lmaweb.com/

<sup>&</sup>lt;sup>92</sup>https://extension.psu.edu/biosecurity-a-practical-approach

<sup>&</sup>lt;sup>93</sup>http://www.aabp.org/resources/AABP\_Guidelines/Practical\_Euthanasia\_of\_Cattle-September\_2013.pdf

- 7) State cattlemen's organizations' BQA programs
- 8) <u>University of Tennessee<sup>94</sup></u>
- 9) USDA-APHIS<sup>95</sup>

## AUCTION MARKET SECTOR SUSTAINABILITY ASSESSMENT GUIDE: INDICATOR 2.6: EMPLOYEE SAFETY AND WELL-BEING

#### METRIC 2.6: IS AN EMPLOYEE SAFETY PROGRAM IN PLACE?

#### DESCRIPTION OF INDICATOR AND METRIC

**USRSB defines Employee Safety and Well-being as:** The implementation of safety programs and training to provide a safe workplace and help to prevent workplace accidents and injuries associated with production, processing, and distribution of beef and the relative prosperity of workers employed in those activities.

An auction market employee safety program can offer the dual benefit of protecting the safety and improving the well-being of those who are employed at the auction, as well as reducing stress and potential injury to cattle, thereby also improving the Animal Health and Well-being Indicator and metric. As with other sectors that regularly handle and care for cattle, a reduction in animal stress and injury improves animal performance and, in turn, improves profitability under the Efficiency and Yield Indicator for sectors up and down the value chain.

Safety training programs for auctions are broadly available as a component of the <u>Livestock Marketing</u> <u>Association (LMA) Guide to Animal Handling and Employee Training<sup>96</sup></u>. Several state cattlemen's associations also provide their members with sector-specific safety training. The LMA assists auction markets with development of written safety programs and safety inspections and provides in-person training to auction employees. Many such resources are available to aid in the development of an individual operation's safety program.

#### **GUIDANCE TO ACHIEVE THE METRIC**

Answering the following questions will assist auction operators in highlighting areas that are currently well managed and areas that can be improved, as well as helping develop an understanding of the current state of the Employee Safety and Well-being Indicator, at the auction, to facilitate continuous improvement in this indicator.

- 1) Is a written safety plan provided to employees?
  - Each auction should have a written plan with policies and procedures specific to that facility to ensure employees know how to carry out their job duties in the safest way possible.
- 2) Are routine safety meetings held?

<sup>94</sup> https://extension.tennessee.edu/publications/Documents/SP604.pdf

<sup>&</sup>lt;sup>95</sup>https://www.aphis.usda.gov/animal\_health/emergency\_management/downloads/documents\_manuals/cowcalf\_industrymanual.pdf

<sup>&</sup>lt;sup>96</sup>https://lmaweb.com/animal-handling/

- Since safety practices are always evolving and improving, routine meetings keep employees up-todate and refreshed on the latest policies and procedures.
- 3) Are periodic (annual) safety assessments/audits performed?
  - Having an outside entity analyze the effectiveness of an auction's safety program on a regular basis helps to troubleshoot potential problems and continually improve employee safety.
- 4) Are accidents documented and/or investigated in-house?
  - One key to improving safety is investigating when accidents do happen and figuring out how to prevent the same thing from happening in the future.

#### 5) Does the auction sponsor community activities and encourage employee involvement?

 Auctions are valued business members of their local communities. Auctions should strive to be good neighbors, which can be achieved through a variety of activities, depending on resources and location. If auctions are good neighbors in their community, this can positively influence auction employee well-being.

#### TOOLS AND INFORMATIONAL RESOURCES

The following resources can be helpful to those seeking to improve their operations; it is not intended to be an exhaustive list. USRSB does not own or manage these resources, but they are provided as potential helpful tools for value chain participants.

- 1) Kansas Livestock Association 97
- 2) Livestock Marketing Association<sup>98</sup>
- 3) <u>Nebraska Cattlemen's Association<sup>99</sup></u>
- 4) OSHA form 300<sup>100</sup>
- 5) <u>Safety Made Simple<sup>101</sup></u>
- 6) <u>Society for Human Resource Management<sup>102</sup></u>
- 7) State cattlemen's organizations' safety programs
- 8) Workers' compensation providers

#### REFERENCES

- Chenoweth, D., Ph.D., FAWHP. (2014). Promoting Employee Well-being. Society for Human Resource Management (SHRM) Foundation's Effective Practice Guidelines Series. Retrieved from <u>https://www.shrm.org/hr-today/trends-and-forecasting/special-reports-and-expert-</u> <u>views/Documents/Promoting-Employee-Wellbeing.pdf</u>
- GIPSA. 2016. Packers and Stockyards Program Annual Report. (2016). U.S. Department of Agriculture. pp 9. Retrieved from <u>https://www.gipsa.usda.gov/psp/publication/ar/2016\_PSP\_Annual\_Report.pdf</u>
- Grandin, T. (2015). Improving Animal Welfare, A Practical Approach. 2<sup>nd</sup> Ed. Colorado State University.
- Grandin, T. (2016). Evaluation of the Welfare of Cattle Housed in Outdoor Feedlot Pens. *Veterinary and Animal Science. 1, pp 23-28.* Department of Animal Science. Colorado State University.
- Livestock Marketing Association (LMA). (2018). Information provided during interview.

<sup>99</sup>https://nebraskacattlemen.org/

<sup>97</sup>https://www.kla.org/

<sup>&</sup>lt;sup>98</sup>https://lmaweb.com/

<sup>&</sup>lt;sup>100</sup>https://www.osha.gov/recordkeeping/RKforms.html

<sup>&</sup>lt;sup>101</sup>https://www.safetymadesimple.com/

<sup>102</sup> https://www.shrm.org/

USDA-NASS. 2018. Cattle Inventory Data. U.S. Department of Agriculture. (2018). [Data File]. Accessed on September 22, 2018. Retrieved from

https://www.nass.usda.gov/Surveys/Guide\_to\_NASS\_Surveys/Cattle\_Inventory/

OIE. 2017. World Organization for Animal Health. Animal Welfare and Beef Cattle Production Systems. (2017). *Terrestrial Animal Health Code. Chapter 7.9.* Retrieved from <u>http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre\_aw\_beef\_catthe.htm</u>

## U.S. BEEF INDUSTRY SUSTAINABILITY FRAMEWORK: 3. FEEDYARD SECTOR

OVERVIEW OF THE FEEDYARD SECTOR	59
FEEDYARD SECTOR SUSTAINABILITY ASSESSMENT GUIDES (SAG)	60
Continuous Improvement Strategy	61
SAG FOR INDICATOR 3.1 WATER RESOURCES	61
Metric 3.1	61
Description of Indicator and Metric	61
Guidance to Achieve the Metric	62
Tools and Informational Resources	63
SAG FOR INDICATOR 3.2 LAND RESOURCES	64
Metric 3.2	64
Description of Indicator and Metric	64
Guidance to Achieve the Metric	65
Tools and Informational Resources	66
ADDITIONAL GUIDANCE TO ACHIEVE THE NUTRIENT MANAGEMENT PLAN METRIC FOR	INDICATORS 3.1
AND 3.2	68
Nutrient Management Plan Discussion	68
Tools and Informational Resources	68
SAG FOR INDICATOR 3.3 AIR AND GREENHOUSE GAS EMISSIONS	70
Metric 3.3	70
Description of Indicator and Metric	70
Guidance to Achieve the Metric	71
Tools and Informational Resources	71
ANIMAL FEED CONTINUOUS IMPROVEMENT GUIDANCE AS RELATED TO METRICS AND 3.2, AND 3.3.	INDICATORS 3.1,
Cooperative Agreement with Field to Market Regarding Feed Production Indicators, Me Benchmarks	etrics, and 73
SAG FOR INDICATOR 3.4 EFFICIENCY AND YIELD	73
Metric 3.4	73
Description of Indicator and Metric	73
Guidance to Achieve the Metric	74
Tools and Informational Resources	75
SAG FOR INDICATOR 3.5 ANIMAL HEALTH AND WELL-BEING	76
Metric 3.5	76
Description of Indicator and Metric	76
Guidance to Achieve the Metric	77
Provide Disease Prevention Practices to Protect Herd Health	79

Veterinarian-Client-Patient Relationship	80
Antibiotic Stewardship	80
Provide Appropriate Transportation for the Cattle	
Tools and Informational Resources	83
SAG FOR INDICATOR 3.6 EMPLOYEE SAFETY AND WELL-BEING	83
Metric 3.6	
Description Of Indicator and Metric	
Guidance to Achieve the Metric	
Tools and Informational Resources	
REFERENCES	

## **OVERVIEW OF THE FEEDYARD SECTOR**

The Feedyard Sector consists of operations where cattle are fed a balanced growth diet for four to six months and receive daily care. The U.S. is the world's largest beef producer and hosts the largest fed-cattle industry. Beef production in the U.S. is both for domestic consumption and global export. Geographically, there are cattle fed to market distributed across the U.S., with the greatest concentrations in the Great Plains, Midwest (Corn Belt), Southwest, and Pacific Northwest. Generally speaking, the cattle feeding industry utilizes grain and a variety of other byproducts to finish cattle and produce high-quality grades (Select, Choice, and Prime) of beef. On a retail equivalent basis, the U.S. beef industry creates more than \$100 billion of value annually.

The current demographics of the U.S. cattle feeding industry show a wide range of participants (Figure 1). Summary data from 2017 (USDA, 2018) counts a total of 28,209 operating feedyards. Of this total, 26,000 feedyards have a capacity of less than 1,000 head. Collectively, this group of feedyards account for about 18% of the inventory on feed as of January 1, 2018.



Number of Feedyards in Operation in 2017

Figure 1: Feedyard demographics in the U.S. in 2017 (USDA, 2018)

The total number of feedyards has declined in the last 20 years, with larger yards marketing an increasing proportion of the fed cattle each year. In the 2017 marketing year, 259 feedyards (with capacities greater than 16,000 head) marketed 62% of the fed cattle (Figure 2). This shift, as in many industries, is primarily due to economies of scale and the ability of larger operations to focus specifically trained employees in defined roles, thus improving efficiencies.



Inventory of Cattle in Feedyards on January 1, 2018, by Feedyard Size Source: USDA

Figure 2: Feedlot Size Distribution for 2017 (USDA, 2018)

### FEEDYARD SECTOR SUSTAINABILITY ASSESSMENT GUIDES

The following Sustainability Assessment Guidelines (SAGs) provides a self-assessment tool for each of the six high-priority indicators, which will allow individual operators to assess their own operations in an effort to maintain progress to date and continue to make improvements across the indicators.

The following SAGs describe and define the metrics for each of the six high-priority sustainability indicators. The SAGs also include resources and tools which will assist individual operators in assessing their own operations and identifying and implementing opportunities for improvement as it relates to the sustainability indicators. Importantly, adoption and use of the methods and tools described in the SAGs is voluntary. The SAGs are primarily intended to assist operators in improving a wide range of outcomes on their operations over time.

For each of the six high-priority indicators, the SAG will include:

- 1) A description of the indicator to ensure a clear understanding of its intent
- 2) A description of the metric selected to measure the indicator
- 3) Supporting guidelines that elaborate on the context of the metric, including guidelines to address various elements of the metric
  - It is important to note:
    - i) Individual operators may or may not be addressing all the items asked in the supporting guidelines for a particular metric
    - ii) Knowing what some of these additional elements are creates the opportunity for that operator to consider addressing those items going forward
    - iii) Action on the part of the operator to address the listed items, or other items, over time is a means of demonstrating continuous improvement

- 4) Resources for implementation (not meant to be an exhaustive list), including:
  - Recommended practices for improving a particular metric
  - Summary of existing information for that metric
  - Tools (software, apps, hardware, etc.), for supporting metric assessment
  - Case studies
  - Technical support information
- 5) Suggested methods to monitor change and/or progress over time

A key tenet of sustainability is managing any operational task to strive toward **continuous improvement.** As this self-assessment is worked through on an operation, the guidelines below should be considered, and implementation planned in accordance with individual operation environments, situations, and needs. Methods to monitor change and/or progress over time also need to be identified. Incorporating guidelines, such as those identified in this SAG, into routine process reviews will potentially improve both the efficiency and sustainability of the operation.

#### CONTINUOUS IMPROVEMENT STRATEGY

As producers apply these metrics, developing and implementing the plans and practices described, it may be useful for them to answer the following questions in order to measure the effectiveness of their efforts, document their progress, and ensure continuous improvement:

- 1) Metrics Logistics: What will be measured, when, how, and by whom?
- 2) Indicator Improvement Process: How will the indicator be improved through implementation of this metric?
- 3) **Metric Reporting Strategy:** How will the metric(s) be recorded, benchmarked, and analyzed within the operation?
- 4) **Metric Success Criteria:** What constitutes continuous improvement for the metric as it applies to the operation?

## FEEDYARD SECTOR SUSTAINABILITY ASSESSMENT GUIDE: INDICATOR 3.1: WATER RESOURCES

METRIC 3.1: ARE WATER RESOURCE MANAGEMENT STRATEGIES IMPLEMENTED AT THE FEEDYARD THAT ADDRESS WATER MANAGEMENT, WATER USE OPTIMIZATION AND CONSERVATION, AND WATER QUALITY?

#### DESCRIPTION OF INDICATOR AND METRIC

**USRSB defines Water Resources as:** The volume of water used by a sector for each process, and any impacts on water quality by a sector for each process.

Adopting a water resource management strategy at a feedyard impacts both water quantity and quality significantly by allowing the feedyard to monitor and put measures in place to optimize and recycle water, as well as protect surface and groundwater quality. These strategies will differ and be dependent on the water availability and environment where the feedlot is located. This sustainability metric also has an impact on the Land Resources, Air and Greenhouse Gas Emissions, and Animal Health and Well-being Indicators because it provides a process for appropriately applying nutrients from captured water to improve and protect soil quality, as well as always maintaining and providing an adequate supply of clean

water to animals. Many times, this is achieved through implementation of an appropriate nutrient management plan (NMP) specific to an individual feedyard.

Regulatory requirements on feedyards with capacity for 1,000 beef cattle animal units or more have led to almost all such feedyards having a federal Clean Water Act (CWA) permit. Many states have permit requirements for feedyards smaller than 1,000-head capacity as well. These permits include hundreds of pages of requirements, periodic inspections, and recordkeeping requirements. All types of cattle operations are expected to operate within the boundaries of federal, state, and local regulations; nothing stated in the U.S. Beef Industry Sustainability Framework is intended to contradict or take precedence over those regulations.

Facilities meeting the regulatory capacity thresholds are under a "zero discharge" legal obligation, and even permitted facilities are considered to be under "zero discharge" permits, meaning that every drop of water that has touched the production area of the feedyard must be captured and processed appropriately. Any unanticipated release of processed water is only authorized by the permit when a facility receives extreme amounts of precipitation in a short period of time, above and beyond the design storm capacity of the retention pond(s). The premise of the federal requirement is to protect water quality. The violation of such protections carries criminal and/or civil penalties (NPDES, 2017). Feedyards with less than the 1,000-head capacity are still under obligations to protect water quality and the Water Resources Metric allows those feedyard operators to consider the different aspects around water resources, including conservation and management. Resources are available from several land grant universities to aid smaller feedyards in developing such strategies or plans.

Strategies such as dust control measures that may be in place to mitigate air and greenhouse gas (GHG) emissions are largely watering systems which increase the overall consumption of water by the feedyard and can increase GHG emissions. In these cases, it is important to understand the intricacies and complexities of the tradeoffs between the sustainability metrics when they are implemented in a production agriculture setting. Reducing the impact of one metric may increase the impact of another metric. These decisions should be informed by local and regional priorities, defined across the sector.

#### **GUIDANCE TO ACHIEVE THE METRIC**

The following questions help identify potential actions or steps that will contribute to sustainable practices that support improved Water Resources Indicator outcomes. These questions are followed by corresponding informational resource references to assist in achieving the metric. Additional details regarding NMPs for feedyards are provided in the <u>Additional Guidance to Achieve the Nutrient</u> <u>Management Plan Metric for Indicators 3.1 and 3.2</u> section located immediately after the Land Resources section.

- 1) Is the feedyard a member of a local groundwater or surface water management district?
- 2) Is the feedyard fully implementing required groundwater or surface water management practices and complying with all local district regulations?
- 3) Does the feedyard have a process in place to annually assess the quantity of water utilized by the operation (the feedyard itself as well as any associated irrigated acres)?
- 4) Is the feedyard implementing water conservation measures in an effort to minimize water waste?
- 5) Are practical and realistic measures being taken to reuse and/or recycle water fully?
- 6) Does the feedyard utilize stormwater runoff that is captured in holding ponds, such as for irrigating crops or mitigating dust?
- 7) Does the feedyard utilize water conserving means to keep livestock drinking water from freezing?

- 8) Is water use reviewed regularly, and are any major deviations from the historical mean analyzed to determine the cause?
- 9) Are water leaks repaired quickly?
- 10) Is the water quality management strategy for the feedyard documented?
- 11) Has the feedyard obtained water quality permit coverage or enrolled in a voluntary water quality management program?
- 12) Is the feedyard following an NMP to properly address the production, collection, storage, and beneficial use of manure and process wastewater?
- 13) Are water quality measures being implemented in accordance with permits or other voluntary program requirements?
- 14) Has the feedyard identified all potential pollutant sources and established measures to prevent water quality impacts?
- 15) Are manure and effluent applied to feedyard land in accordance with an NMP or equivalent?
- 16) Is the retention pond(s) properly lined with appropriate soil or synthetic materials to be protective of groundwater resources?
- 17) Is a storage level gauge installed to indicate critical liquid levels, such as maximum level for maintaining storage capacity for a 25-year, 24-hour storm and maximum storage level for entering winter?
- 18) Are regular inspections made and records maintained of holding pond levels and holding pond structural integrity?
- 19) Is stormwater runoff analyzed to accurately account for the nutrients applied to the land?
- 20) Are employees with environmental management responsibilities trained, at least annually?
- 21) Is the feedyard in compliance with all applicable water quality regulations?

#### TOOLS AND INFORMATIONAL RESOURCES

The following resources can be helpful to feedyards seeking to improve their operations in regard to water resources; it is not intended to be an exhaustive list. USRSB does not own or manage these resources, but they are provided as potential helpful tools for value chain participants.

- 1) Agricultural Phosphorus Management and Water Quality Protection in the Midwest<sup>103</sup>
- 2) <u>Chapter 1: Laws, Regulations, Policy, and Water Quality Criteria<sup>104</sup></u>, USDA-NRCS
- 3) <u>Chapter 2: Planning Considerations</u><sup>105</sup>, USDA-NRCS
- 4) Commercial services
- 5) Land grant universities and extension services
  - Land Application Assessment tools
  - Whole Farm Nutrient Balance tools
- 6) Manure and Nutrient Management in Tile Drained Lands<sup>106</sup>
- 7) <u>NRCS Conservation Planning Workbook<sup>107</sup></u>
- 8) <u>Phosphorus Indices: Taking Stock of Where We Are and Where We Need to Be</u><sup>108</sup>

<sup>&</sup>lt;sup>103</sup>http://extensionpublications.unl.edu/assets/pdf/rp187.pdf

<sup>&</sup>lt;sup>104</sup>http://www.wcc.nrcs.usda.gov/ftpref/wntsc/AWM/handbook/ch1.pdf

<sup>&</sup>lt;sup>105</sup>https://www.wcc.nrcs.usda.gov/ftpref/wntsc/AWM/handbook/ch2.pdf

<sup>&</sup>lt;sup>106</sup>http://articles.extension.org/pages/72930/manure-and-nutrient-management-in-tile-drained-lands

<sup>&</sup>lt;sup>107</sup>https://www.nrcs.usda.gov/Internet/FSE\_DOCUMENTS/nrcs144p2\_052852.pdf

<sup>&</sup>lt;sup>108</sup>http://articles.extension.org/pages/67754/phosphorus-indices:-taking-stock-of-where-we-are-and-where-we-need-to-be

- 9) <u>Preferential Flow of Manure in Tile Drainage<sup>109</sup></u>
- 10) Regulations Related to Livestock and Poultry Production<sup>110</sup>
- 11) State cattlemen's associations environmental services

State and region-specific resources are regularly updated online at <u>www.beefsustainability.us</u>.

## FEEDYARD SECTOR SUSTAINABILITY ASSESSMENT GUIDE: INDICATOR 3.2: LAND RESOURCES

#### METRIC 3.2: HAS A NUTRIENT MANAGEMENT STRATEGY OR PLAN BEEN IMPLEMENTED?

#### DESCRIPTION OF INDICATOR AND METRIC

**USRSB defines Land Resources as:** The stewardship of terrestrial and aquatic habitat in relation to water, soil, and biodiversity in an area, impacts of land use and land use conversion, both caused by and prevented by ranching and farming activities and other value-chain land use decisions.

A feedyard owner and operator who implements an NMP will have a significant impact on the sustainability indicators of land resources and water resources because such a plan will include managing wastewater, monitoring soil health, and prescribing the proper application rates of nutrients. Doing this protects surface and groundwater quality, as well as improving and protecting soil quality and crop yields (Pagani et al., 2013). Desired outcomes of this indicator and metric include improvement of manure wastewater management at the feedyard level and improvement of and monitoring of soil health as it relates to NMPs. Application of nutrient-rich, organic manure and wastewater can reduce the need for artificial/commercial fertilizer (Koelsch, 2005), increasing the profitability of the feedyard and potentially other nearby farms by providing an economically feasible and readily available source of nutrients (Schlegel et al., 2015a; 2015b), which also has a positive impact on the Efficiency and Yield Indicator. The efficient recycling of nutrients through an NMP will often also reduce air and greenhouse gas emissions (Montes et al., 2013; Waldrip et al., 2015).

Feedyards with federal National Pollutant Discharge Elimination Systems (NPDES) permits are required to have and implement an NMP. Recordkeeping is an essential part of implementing an NMP. Feedyards not under federal permits also have resources available to guide them in development of an NMP or strategy. Land grant universities and extension services across the country have provided these resources to producers, including <u>lowa State University's Beef Feedlot Systems Manual<sup>111</sup></u>, which provides guidance on housing and floor structures, manure handling and storage, and proper application of manure. Similar resources can be found at the University of Nebraska, Kansas State University, Texas A&M University, and other universities, as well as government agencies such as the U.S. Department of Agriculture (USDA) National Resource Conservation Service (NRCS). Due to differences in soil types, climate, and other factors, it is important for feedyards to base a plan on the best regional data and resources. All feedyards, no matter their size or location, have the ability to develop a plan that works for their operation.

<sup>&</sup>lt;sup>109</sup>http://articles.extension.org/pages/27488/preferential-flow-of-manure-in-tile-drainage

<sup>&</sup>lt;sup>110</sup>http://articles.extension.org/pages/8953/regulations-related-to-livestock-and-poultry-production

<sup>&</sup>lt;sup>111</sup>https://store.extension.iastate.edu/product/Beef-Feedlot-Systems-Manual

#### **GUIDANCE TO ACHIEVE THE METRIC**

The following questions recommend actions or steps that contribute to a sustainable NMP in support of the Land Resources Indicator and Metric, along with corresponding informational resource references. Additional details regarding NMPs for feedyards are also provided in the <u>Additional Guidance to Achieve</u> <u>the Nutrient Management Plan Metric for Indicators 3.1 and 3.2</u> section that is located immediately after the Land Resources section.

- 1) Regulatory Compliance; Resources A, B
  - Is the feedyard operating under either a federal or state water quality permit?
    - i) If "Yes," the feedlot does not need to answer the following questions, as they are covered in terms and conditions of the permit.

#### 2) Standard Operating Procedures (SOP) or Planning Procedures

- Are your NMPs documented?
- Are the NMPs developed by a certified nutrient management specialist or certified crop advisor?
- Has a Whole Farm Phosphorus Balance been conducted on the feedlot and farming operation within the past three years?
  - i) Resource C
- Is a SOP maintained and implemented for soil sampling and analysis?
  - i) Resource D
- Is a SOP maintained and implemented for manure/effluent sampling and analysis?
  - i) Resource D
- Is a SOP maintained and implemented for estimation of crop yield goals and nutrient requirements?
- Is a SOP maintained and implemented for crop rotation and preferred manure application timing within rotation?
- Is a SOP maintained and implemented for manure and effluent application rate calibration?
   i) Resources E, F
- Is a SOP maintained and implemented for land application equipment, dewatering equipment, and transfer piping inspections and maintenance?
- Is a SOP maintained and implemented for land application site inspection following manure application?
- Is a SOP maintained and implemented for manure spill containment?
- Is a SOP maintained and implemented for pumps, piping, and irrigation equipment for dewatering runoff holding ponds?
- 3) Records; Resources H, I
  - Is the feedyard current on all reporting requirements?
  - Are records maintained for the following NMP parameters?
    - i) Crop yields?
    - ii) Individual field nutrient budgets?
    - iii) Manure sampling?
    - iv) Soil sampling?
    - v) On-site manure/wastewater application rates, timing, and weather conditions?
    - vi) Off-site manure/effluent transfers and timing?
    - vii) Employee training?
    - viii) Manure and effluent application equipment inspections?
- 4) Site Review; Resources J, K

- Are runoff holding ponds designed, built, and managed to contain required storm event?
- If runoff holding ponds are not used, has an alternative technology been employed to manage the stormwater runoff?
- Do any of the following higher risk characteristics exist for planned land application sites?
  - i) Designated by NRCS as highly erodible land?
  - ii) Karst topography, sinkholes, or other connection to ground water?
  - iii) Shallow high-water table (less than four feet)?
  - iv) Flooding potential (one in five years or more)?
  - v) Soils with soil test P levels identified as very high or excessive?
  - vi) Unused or abandoned wells not properly sealed?
    - (1) Resources L, M
  - vii) Tile drained fields draining directly to surface water?
  - viii) Less than 30-foot vegetative buffer between manure application and surface water or well?

#### 5) **Practice Review—Land Application**; *Resource N*

- Is a USDA-approved conservation plan in place?
  - i) Resources O, P
- Is surface application of manure made only to fields maintained with high residue or growing cover or crop in place?
- Is subsurface-applied manure done with implements designed to minimize crop residue or growing crop loss?
- Is a phosphorus (P) Index or other P risk assessment conducted prior to land application of manure/effluent?
  - i) Resources Q, R
- During winter manure application, are fields with low risk of runoff targeted for frozen soils?
   i) Resource S
- During winter manure application, are snow covered fields avoided?
  - i) Resource S
- Is stockpiled manure remotely located from surface water, bermed, or covered to minimize the risk of runoff to surface water and nuisance to neighbors?
- Off-farm land application: Is an analysis of manure/effluent delivered to manure hauler and land manager?
- Are the equipment and supplies for containment of a manure spill fully stocked and accessible?
   i) Resource G

#### 6) Training

- Has an employee and/or consultant been assigned responsibility for assuring compliance?
- Has employee training been completed on nutrient planning SOPs in the last three years or in an appropriate amount of time stated by the current federal or state water quality permit the feedyard is operating under?
  - i) Sample Program: T

#### 7) Continuous Improvement

- Is a written list maintained of "high priority" changes in facility design or management practices for future planning?

#### TOOLS AND INFORMATIONAL RESOURCES

The following resources can be helpful to producers seeking to improve their operations regarding land resources; it is not intended to be an exhaustive list. USRSB does not own or manage these resources, but they are provided as potential helpful tools for value chain participants.

- A. <u>Chapter 1: Laws, Regulations, Policy, and Water Quality Criteria<sup>112</sup></u>, USDA-NRCS <u>Agricultural Waste Management Field Handbook<sup>113</sup></u>
- B. <u>Regulations Related to Livestock and Poultry Production<sup>114</sup></u>
- C. Whole Farm Nutrient Planning<sup>115</sup>
- D. Manure Testing Information and Resources<sup>116</sup>
- E. <u>Calibration of Manure Application Equipment<sup>117</sup></u>
- F. LPES Lesson 36: Land Application Equipment<sup>118</sup>
- G. Manure Spills and Emergency Planning<sup>119</sup>
- H. <u>Record Keeping and Inspection for Animal Feeding Operations<sup>120</sup></u>
- I. <u>Nutrient management planning (NMP) Records Checklist and Sample Records</u><sup>121</sup>
- J. <u>Chapter 5: Roles of Soils in Waste Management<sup>122</sup></u>, USDA-NRCS <u>Agricultural Waste Management</u> <u>Field Handbook<sup>123</sup></u>
- K. <u>Chapter 7: Geological and Groundwater Considerations<sup>124</sup></u>, USDA-NRCS <u>Agricultural Waste</u> <u>Management Field Handbook<sup>125</sup></u>
- L. <u>Preferential Flow of Manure in Tile Drainage<sup>126</sup></u>
- M. <u>Manure and Nutrient Management in Tile Drained Lands<sup>127</sup></u>
- N. LPES Lesson 32: Land Application Best Management Practices
- O. NRCS Conservation Planning Workbook 128
- P. <u>Chapter 2: Planning Considerations<sup>129</sup></u>, USDA-NRCS <u>Agricultural Waste Management Field</u> Handbook<sup>130</sup>
- Q. Agricultural Phosphorus Management and Water Quality Protection in the Midwest<sup>131</sup>
- R. <u>Phosphorus Indices: Taking Stock of Where We Are and Where We Need to Be</u><sup>132</sup>
- S. <u>Winter Manure Application Options</u><sup>133</sup>

<sup>&</sup>lt;sup>112</sup>http://www.wcc.nrcs.usda.gov/ftpref/wntsc/AWM/handbook/ch1.pdf

<sup>&</sup>lt;sup>113</sup>https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/water/?&cid=stelprdb1045935

<sup>&</sup>lt;sup>114</sup>http://articles.extension.org/pages/8953/regulations-related-to-livestock-and-poultry-production <sup>115</sup>http://articles.extension.org/sites/default/files/w/f/f3/LES\_02.pdf

<sup>&</sup>lt;sup>116</sup>http://articles.extension.org/pages/16397/manure-testing-information-and-resources

<sup>&</sup>lt;sup>117</sup>https://articles.extension.org/pages/16350/calibration-of-manure-application-equipment

<sup>&</sup>lt;sup>118</sup>https://articles.extension.org/pages/16350/calibration-of-manure-application-equipm

<sup>&</sup>lt;sup>119</sup>http://articles.extension.org/pages/28679/manure-spills-and-emergency-planning

<sup>&</sup>lt;sup>120</sup>http://articles.extension.org/pages/16351/record-keeping-and-inspections-for-animal-feeding-operations

<sup>&</sup>lt;sup>121</sup>https://articles.extension.org/sites/default/files/SampleRecords.pdf

<sup>&</sup>lt;sup>122</sup>https://www.wcc.nrcs.usda.gov/ftpref/wntsc/AWM/handbook/ch5.pdf

<sup>&</sup>lt;sup>123</sup>https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/water/?&cid=stelprdb1045935

<sup>&</sup>lt;sup>124</sup>https://www.wcc.nrcs.usda.gov/ftpref/wntsc/AWM/handbook/ch7.pdf

<sup>&</sup>lt;sup>125</sup>https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/water/?&cid=stelprdb1045935

<sup>&</sup>lt;sup>126</sup>http://articles.extension.org/pages/27488/preferential-flow-of-manure-in-tile-drainage

<sup>&</sup>lt;sup>127</sup>http://articles.extension.org/pages/72930/manure-and-nutrient-management-in-tile-drained-lands

<sup>&</sup>lt;sup>128</sup>https://www.nrcs.usda.gov/Internet/FSE\_DOCUMENTS/nrcs144p2\_052852.pdf

<sup>&</sup>lt;sup>129</sup>https://www.wcc.nrcs.usda.gov/ftpref/wntsc/AWM/handbook/ch2.pdf

<sup>&</sup>lt;sup>130</sup>https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/water/?&cid=stelprdb1045935

<sup>&</sup>lt;sup>131</sup>http://extensionpublications.unl.edu/assets/pdf/rp187.pdf

<sup>&</sup>lt;sup>132</sup>http://articles.extension.org/pages/67754/phosphorus-indices:-taking-stock-of-where-we-are-and-where-we-need-to-be

<sup>&</sup>lt;sup>133</sup>http://articles.extension.org/pages/71928/winter-manure-application-options

T. <u>Wisconsin Professional Manure Applicator Education<sup>134</sup></u>

State and region-specific resources are regularly updated online at <u>www.beefsustainability.us</u>.

## ADDITIONAL GUIDANCE TO ACHIEVE THE NUTRIENT MANAGEMENT PLAN METRIC FOR INDICATORS 3.1 AND 3.2

#### NUTRIENT MANAGEMENT PLAN DISCUSSSION

USRSB recognizes the importance that NMPs play in addressing and improving both the Water Resource and Land Resource Indicators and Metrics. The following is meant to provide additional detail regarding an NMP for feedyards.

Previously, nutrient management simply meant feeding cattle a balanced diet for desired growth and production. Today, an NMP as defined by the U.S. Environmental Protection Agency (EPA) includes all aspects of manure and wastewater production, collection, storage, treatment, and use. Applying manure or wastewater to cropland at rates that are beneficial to optimize crop growth and to maintain soil productivity are major components of an NMP. Compliance with a properly designed NMP will ensure protection of soil, air, and water.

Some livestock producers are potentially subject to regulations from the Federal Clean Water Act, administered by the EPA and delegated state agencies. Livestock operations defined or designated as a Concentrated Animal Feeding Operation (CAFO) have specific requirements under these regulations. Operations may be required to obtain a NPDES, CAFO-specific permit, but each operation needs to check with its own state regulations or one of the 10 regional EPA offices to find out what must be done to be in compliance with the law. These rules stipulate requirements about how manure and wastewater may be applied to the land.

The primary goal of an NMP is to make the best use of available nutrients and land resources for crop production while being protective of the environment. Though not required for all operations, it is strongly recommended that all facilities develop and maintain compliance with an NMP that documents manure and wastewater management plans, including how manure will be applied to the crop lands, and the actual nutrient content of the applications. An effective plan should meet the production goals of the producer while enabling the producer to be a good steward of the environment. Resources to assist producers with understanding, developing, and implementing an NMP can be found below.

#### TOOLS AND INFORMATIONAL RESOURCES

The following resources can be helpful to producers seeking to improve their operations regarding NMPs; it is not intended to be an exhaustive list. USRSB does not own or manage these resources, but they are provided as potential helpful tools for value chain participants.

- 1) Agricultural Phosphorus Management and Water Quality Protection in the Midwest<sup>135</sup>
- 2) Bovine Alliance on Management and Nutrition: Introduction to Nutrient Management for Cattle Feedyard Sector Sustainability Assessment Guide

 <sup>&</sup>lt;sup>134</sup>http://articles.extension.org/pages/72756/wisconsin-professional-manure-applicator-education
 <sup>135</sup>http://extensionpublications.unl.edu/assets/pdf/rp187.pdf

- 3) <u>Calibration of Manure Application Equipment</u><sup>136</sup>
- 4) <u>Chapter 1: Laws, Regulations, Policy, and Water Quality Criteria<sup>137</sup></u>, USDA-NRCS
  - Agricultural Waste Management Field Handbook<sup>138</sup>
- 5) <u>Chapter 2: Planning Considerations<sup>139</sup></u>, USDA-NRCS <u>Agricultural Waste Management Field Handbook<sup>140</sup></u>
- 6) <u>Chapter 5: Roles of Soils in Waste Management<sup>141</sup></u>, USDA-NRCS <u>Agricultural Waste Management Field</u> <u>Handbook<sup>142</sup></u>
- 7) <u>Chapter 7: Geological and Groundwater Considerations<sup>143</sup></u>, USDA-NRCS <u>Agricultural Waste</u> Management Field Handbook<sup>144</sup>
- 8) LPES Lesson 32: Land Application Best Management Practices<sup>145</sup>
- 9) LPES Lesson 36: Land Application Equipment<sup>146</sup>
- 10) Manure and Nutrient Management in Tile Drained Lands<sup>147</sup>
- 11) Manure Spills and Emergency Planning<sup>148</sup>
- 12) Manure Testing Information and Resources<sup>149</sup>
- 13) NRCS Conservation Planning Workbook<sup>150</sup>
- 14) Nutrient management planning (NMP) Records Checklist and Sample Records<sup>151</sup>
- 15) Phosphorus Indices: Taking Stock of Where We Are and Where We Need to Be<sup>152</sup>
- 16) Preferential Flow of Manure in Tile Drainage<sup>153</sup>
- 17) <u>Record Keeping and Inspection for Animal Feeding Operations<sup>154</sup></u>
- 18) <u>Regulations Related to Livestock and Poultry Production<sup>155</sup></u>
- 19) State cattlemen's associations
- 20) State environmental agencies
- 21) State extension services and specialists
  - Example: Beef Feedlot Systems Manual from Iowa Beef Center<sup>156</sup>
- 22) University of Arkansas; Nutrient Management Planning for Livestock Operations: An Overview

MAA&url=https%3A%2F%2Fstore.extension.iastate.edu%2FProduct%2FBeef-Feedlot-Systems-Manual-

<sup>&</sup>lt;sup>136</sup>https://articles.extension.org/pages/16350/calibration-of-manure-application-equipment

<sup>137</sup> http://www.wcc.nrcs.usda.gov/ftpref/wntsc/AWM/handbook/ch1.pdf

<sup>&</sup>lt;sup>138</sup>https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/water/?&cid=stelprdb1045935

<sup>&</sup>lt;sup>139</sup>https://www.wcc.nrcs.usda.gov/ftpref/wntsc/AWM/handbook/ch2.pdf

<sup>&</sup>lt;sup>140</sup>https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/water/?&cid=stelprdb1045935

<sup>&</sup>lt;sup>141</sup>https://www.wcc.nrcs.usda.gov/ftpref/wntsc/AWM/handbook/ch5.pdf

<sup>&</sup>lt;sup>142</sup>https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/water/?&cid=stelprdb1045935

<sup>&</sup>lt;sup>143</sup>https://www.wcc.nrcs.usda.gov/ftpref/wntsc/AWM/handbook/ch7.pdf

<sup>&</sup>lt;sup>144</sup>https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/water/?&cid=stelprdb1045935

<sup>&</sup>lt;sup>145</sup>https://articles.extension.org/sites/default/files/w/2/28/LES\_32.pdf

<sup>&</sup>lt;sup>146</sup>https://articles.extension.org/sites/default/files/w/d/dd/LES\_36.pdf

<sup>&</sup>lt;sup>147</sup> http://articles.extension.org/pages/72930/manure-and-nutrient-management-in-tile-drained-lands

<sup>&</sup>lt;sup>148</sup>http://articles.extension.org/pages/28679/manure-spills-and-emergency-planning

<sup>&</sup>lt;sup>149</sup> http://articles.extension.org/pages/16397/manure-testing-information-and-resources

 $<sup>^{150}</sup> https://www.nrcs.usda.gov/Internet/FSE\_DOCUMENTS/nrcs144p2\_052852.pdf$ 

 $<sup>^{151}</sup> https://articles.extension.org/sites/default/files/SampleRecords.pdf$ 

<sup>&</sup>lt;sup>152</sup>http://articles.extension.org/pages/67754/phosphorus-indices:-taking-stock-of-where-we-are-and-where-we-need-to-be

 $<sup>^{153}</sup> http://articles.extension.org/pages/27488/preferential-flow-of-manure-in-tile-drainage$ 

 $<sup>^{154}</sup> http://articles.extension.org/pages/16351/record-keeping-and-inspections-for-animal-feeding-operations-for-ani-feeding-operations-for-ani-feeding-operations-for-ani-feeding-operations-for-ani-feeding-operations-for-ani-feeding-operations$ 

 $<sup>^{155}</sup> http://articles.extension.org/pages/8953/regulations-related-to-livestock-and-poultry-production$ 

<sup>&</sup>lt;sup>156</sup>https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwiPxsTQrOPUAhVEh1QKHZfPCqYQFggo

- 23) Whole Farm Nutrient Planning<sup>157</sup>
- 24) Winter Manure Application Options<sup>158</sup>
- 25) Wisconsin Professional Manure Applicator Education<sup>159</sup>

State and region-specific resources are regularly updated online at <u>www.beefsustainability.us</u>.

## FEEDYARD SECTOR SUSTAINABILITY ASSESSMENT GUIDE: INDICATOR 3.3: AIR AND GREENHOUSE GAS EMISSIONS

## METRIC 3.3: ARE STRATEGIES IN PLACE TO MANAGE AIR AND GREENHOUSE GAS EMISSIONS?

#### **DESCRIPTION OF INDICATOR AND METRIC**

**USRSB defines Air and Greenhouse Gas Emissions as:** The cumulative emissions of pollutants, including particulate matter, greenhouse gases (GHGs), and other gaseous emissions from a sector for each process.

A feedyard that has a strategy in place to manage air and GHG emissions would not only reduce emissions but would also have a secondary benefit to Animal Health and Well-being, Efficiency and Yield, Land Resources, and Water Resources Indicators. The strategy should include practices such as pen management for both wet and dry conditions, road and alley management, and feed processing management for reduced air emissions. Such practices can also impact Water Resources and Land Resources Indicators through the application of process water. Managing average daily gain, feed efficiency, and animal health, and utilizing growth promoting technologies collectively improve animal performance while reducing overall output of manure, air emissions, and waste in general. Adoption of practices recommended in the Efficiency and Yield Indicator section can lead to substantial reductions in air emissions per unit of beef from feedyards (Capper & Hayes, 2012; Cooprider et al., 2011; Rotz et al., 2013; Stackhouse-Lawson et al., 2013).

Feedyards across the U.S. must manage emissions for a variety of reasons, including regulatory requirements and neighborly considerations. Each feedyard has different conditions to consider, and therefore, it is appropriate for this metric to allow for a strategy to manage all air and GHG emissions based on the specific characteristics of that operation. Feedyards should be aware of the environmental concerns and management strategies associated with the six groupings of emissions: ammonia; methane and other GHGs; volatile organic compounds; hydrogen sulfide; dust and other particulates; and odor. Production practices such as feed additives can reduce enteric methane emissions while improving yield and efficiency. Brooks et al. (2016) concluded that "Ionophores are feed additives used to alter rumen bacterial fermentation, allowing for improved feed efficiency and decreased methane emissions." Capper & Hayes (2012), Cooprider et al. (2011), Stackhouse et al. (2012), and Stackhouse-Lawson et al. (2013) demonstrated that growth-promoting technologies such as ionophores, growth implants, and β-

<sup>&</sup>lt;sup>157</sup>http://articles.extension.org/sites/default/files/w/f/f3/LES\_02.pdf

<sup>&</sup>lt;sup>158</sup>http://articles.extension.org/pages/71928/winter-manure-application-options

<sup>&</sup>lt;sup>159</sup>http://articles.extension.org/pages/72756/wisconsin-professional-manure-applicator-education

adrenergic agonists can reduce GHG emissions, volatile organic compounds, and ammonia emissions per unit of beef. However, not all the emissions of concern and associated management practices are applicable to all geographic regions of the U.S. where feedyards are located. Feedyards must use knowledge and judgement of their location needs and limits when implementing management practices associated with this metric.

#### **GUIDANCE TO ACHIEVE THE METRIC**

The following are actions or steps contributing to a sustainable plan in support of the Air and GHG Emissions Indicator and Metric.

#### 1) Are pen management strategies in place for both wet and dry conditions?

 Since average precipitation varies greatly across the U.S., feedyard operators face different pen management challenges based on where their facilities are located. Every area is likely to face some particularly wet or muddy times of year, as well as some dry and dusty times. It is important to manage situations for both air quality caused by possible odor or dust in the air and for cattle well-being. Feedyard operators may scrape mud and manure out of pens during rainy seasons or apply water to settle dust during dry seasons. However, in water-scarce areas, dust control is limited by water availability.

#### 2) Are road and alley management strategies in place?

 The air quality reasons for this are essentially the same as for pen management. However, properly managing roads and alleys also has an impact on efficient delivery of feed, which adds another possible GHG emission variable, as well as potentially reducing maintenance costs, which contributes to yield and efficiency.

#### 3) Are feed processing dust management strategies in place?

Feedyard managers should do their best to limit dust caused by feed milling and processing. This
can be done by improved milling technologies or containment, which also directly affects
efficiency and yield by more efficiently using feed resources and eliminating waste.

#### 4) Are rations properly formulated to optimize performance?

- Much can be done to reduce GHG emissions through cattle diets. Methane emissions caused by
  enteric fermentation can be greatly reduced by feeding a diet higher in energy and simple
  carbohydrates and lower in cellulosic carbohydrates that require extensive fermentation to digest.
- 5) Are growth-promoting technologies utilized to optimize cattle performance during the finishing phase?
  - Growth-promoting technologies such as ionophores, hormone implants, and β-adrenergic agonists can reduce GHG emissions not only through decreasing methane emissions by improving the rumen environment for digestion, but also through decreasing feed requirements and overall natural resources needed to produce a unit of beef. These technologies are not necessarily required for a feedyard to be sustainable, but the benefits they provide should be considered in regard to resource utilization and GHG emissions.
- 6) Is the feedyard's use of fossil fuels and/or electricity periodically reviewed for opportunities to improve efficiency or reduce total use?

#### TOOLS AND INFORMATIONAL RESOURCES
The following resources can be helpful to producers seeking to improve their operations, regarding air and GHG emissions; it is not intended to be an exhaustive list. USRSB does not own or manage these resources, but they are provided as potential helpful tools for value chain participants.

- 1) <u>Air Emissions from Cattle Feedyards and Dairies<sup>160</sup></u>
- 2) <u>Air Management Practices Assessment Tool (confinement systems only)<sup>161</sup></u>
- 3) <u>Air Quality Regulations and Animal Agriculture<sup>162</sup></u>
- 4) <u>Application of Liquid Animal Manures Using Center Pivot Irrigations Systems (odor page 2-5)<sup>163</sup></u>.
- 5) Assessing Your Open Feedlot Manure Management (page 13-14)<sup>164</sup>
- 6) Commercial services
- 7) <u>Controlling Dust and Odor from Open Lot Livestock Facilities</u><sup>165</sup>
- 8) Emissions Control Strategies for Land Application<sup>166</sup>
- 9) EPCRA Reporting: What is it and does it apply to animal feeding operations.<sup>167</sup>
- 10) Federal State and Local Air Quality Regulations Related to Animal Agriculture<sup>168</sup>
- 11) Health Impacts of Air Emissions from Animal Feeding Operations<sup>169</sup>
- 12) Managing Odors, Neighbor Relations, and Estimating Setbacks for Animal Feeding Operations<sup>170</sup>
- 13) Mitigating Air Emissions with Vegetative Environmental Buffers<sup>171</sup>
- 14) Mitigation of Greenhouse Gas Emissions in Animal Agriculture<sup>172</sup>
  - Air Quality Assessment Tool
  - Land grant universities & extension services NAQSAT Confined Beef Barn
  - NAQSAT Open Lot
  - Site Assessment of Neighbor Risk
- 15) NAQSAT for Beef and Dairy<sup>173</sup>
- 16) National Air Quality Assessment Tool<sup>174</sup>
- 17) <u>Reducing or Mitigating Greenhouse Gas Emissions in Animal Agriculture</u><sup>175</sup>
- 18) State cattlemen's associations environmental services

State and region-specific resources are regularly updated online at <u>www.beefsustainability.us</u>.

<sup>&</sup>lt;sup>160</sup>http://articles.extension.org/pages/19734/air-emissions-from-cattle-feedyards-and-dairies

<sup>&</sup>lt;sup>161</sup>http://www.agronext.iastate.edu/ampat/

<sup>&</sup>lt;sup>162</sup>http://articles.extension.org/sites/default/files/Regulation.pdf

 $<sup>^{163}</sup> http://extension publications.unl.edu/assets/pdf/ec778.pdf$ 

<sup>&</sup>lt;sup>164</sup> https://store.extension.iastate.edu/FileDownload.ashx?FileID=1877

<sup>&</sup>lt;sup>165</sup>https://articles.extension.org/sites/default/files/w/c/cd/LES\_42.pdf

 $<sup>^{166}</sup> https://articles.extension.org/sites/default/files/w/2/26/LES\_44.pdf$ 

 <sup>&</sup>lt;sup>167</sup>http://articles.extension.org/pages/28452/epcra-reporting:-what-is-it-and-does-it-apply-to-animal-feeding-operations
 <sup>168</sup>http://articles.extension.org/pages/15484/federal-state-and-local-air-quality-regulations-related-to-animal-agriculture
 <sup>169</sup>http://articles.extension.org/pages/67058/health-impacts-of-air-emissions-from-animal-feeding-operations

<sup>&</sup>lt;sup>170</sup>http://articles.extension.org/pages/67056/managing-odors-neighbor-relations-and-estimating-setbacks-for-animal-feeding-operations

<sup>&</sup>lt;sup>171</sup>http://articles.extension.org/pages/26273/mitigating-air-emissions-with-vegetative-environmental-buffers

<sup>&</sup>lt;sup>172</sup>http://articles.extension.org/pages/69144/reducing-or-mitigating-greenhouse-gas-emissions-in-animal-agriculture <sup>173</sup>http://articles.extension.org/pages/29400/nagsat-for-beef-and-dairy

<sup>&</sup>lt;sup>174</sup>http://naqsat.tamu.edu/beef/?key=4c94c388

<sup>&</sup>lt;sup>175</sup>file:///C:/Users/rkoelsch1/Box/USRSB New/rticles.extension.org/pages/69144/reducing-or-mitigating-greenhouse-gasemissions-in-animal-agriculture

### ANIMAL FEED CONTINUOUS IMPROVEMENT GUIDANCE AS RELATED TO METRICS AND INDICATORS 3.1, 3.2, AND 3.3

## COOPERATIVE AGREEMENT WITH FIELD TO MARKET REGARDING FEED PRODUCTION INDICATORS, METRICS, AND BENCHMARKS

The USRSB recognizes that feed production for the live animal sectors of the beef value chain is an essential element in beef sustainability. To promote collaboration, innovation, and reduce duplicative efforts, USRSB has reached a cooperative agreement with <u>Field to Market</u><sup>176</sup>. Field to Market seeks to drive continuous improvement in the sustainability of commodity crop production. Both organizations are focused on promoting continuous improvement in the sustainability of their respective agricultural value chains. USRSB and Field to Market will work together by:

- 1) Recognizing Field to Market's indicators, metrics, and benchmarks within USRSB documents discussing sustainable feed
- 2) Recognizing USRSB's indicators and metrics within Field to Market documents discussing sustainable beef production
- Encouraging USRSB and Field to Market members, where appropriate, to utilize the resources of the other in pilot projects, potential value-chain agreements, and appropriate public-facing communications
- 4) Sharing scientific learnings, where appropriate
- 5) Participating in the other's meetings and work sessions and provide feedback and expertise when needed

Information on water resources with respect to feed production, for beef animals, can be found in <u>Field to</u> <u>Market references<sup>177</sup></u>.

### FEEDYARD SECTOR SUSTAINABILITY ASSESSMENT GUIDE: INDICATOR 3.4: EFFICIENCY AND YIELD

## METRIC 3.4: ARE CATTLE PERFORMANCE AND OPERATIONAL EFFICIENCY TRACKED OVER TIME FOR THIS FACILITY?

#### DESCRIPTION OF INDICATOR AND METRIC

**USRSB defines Efficiency and Yield as:** 1) Efficiency is expressed as the unit of input required to produce a unit of output, and 2) Yield is the total product generated per unit of time or space. Both concepts address waste as a negative characteristic and drive toward improved profitability.

Feedyard owner and operators routinely monitor a variety of components to evaluate cattle performance and operational efficiency. Among these are such things as average daily gain, feed to gain ratio, and animal health. Reviewing and comparing performance outcomes over time can enhance decision making

<sup>&</sup>lt;sup>176</sup>https://fieldtomarket.org/

<sup>&</sup>lt;sup>177</sup>https://fieldtomarket.org/national-indicators-report-2016/water-quality/ and https:/fieldtomarket.org/national-indicators-report-2016/irrigation-water-use/

and contribute to profitability for the feedyard, thereby directly impacting the Efficiency and Yield Indicator.

Other efficiency measures that feedyards may consider include utilizing growth-promoting technologies, proper ration formulation, higher efficiency feedstuffs, and improved manure management. Such practices might improve a feedyard's profitability by improving animal performance and could also reduce air and GHG emissions (Capper and Hayes, 2012; Capper, 2011; Cooprider et al., 2011).

However, feedyard operators must be mindful of tradeoffs of some practices that provide benefits. For some participants in the beef value chain, these benefits do come at a price. For example, in some locations in order to merchandise manure, area farmers may request that manure be composted. While compost is a benefit to the farmer, the composting process of manure adds cost to the feedyard and can significantly increase ammonia emissions (Montes et al., 2013). More often, there are synergistic relationships between improvements that provide benefits in multiple indicator groups. For instance, improved animal health and well-being will have corresponding improvements in efficiency and yield, as well as reductions in air and GHG emissions (Llonch et al., 2016; Place & Mitloehner, 2014). Understanding these relationships and balancing the tradeoffs creates opportunities for innovation as indicators are optimized.

Further potential measurements of efficiency for feedyard operators are number of employees per thousand head of cattle, tons of feed delivered per truck/mile, number of feed truck miles per month or year, and dollars (units) of utility consumed per head or per ton of feed produced. Many practices that contribute to operational efficiency and yield will likely have crossover benefits to other indicators as well. Regardless of the size of the feedyard, tools and systems are available to support feedyard operators in tracking items that contribute to the Efficiency and Yield Indicator. Extension service personnel have spreadsheets and other tools available. Various accounting system software providers offer feedyard management tools as well.

The measurements for the feedyard Efficiency and Yield Metric are captured in a primary assessment question with a set of supporting questions. The goal of this indicator is not to quantify the efficiency and yield of each feedyard, but rather to help each feedyard develop the process for quantifying and improving its own efficiency and yield. The overall efficiency and yield of the Feedyard Sector at a national level is evaluated through the Life Cycle Assessment (LCA) process.

#### **GUIDANCE TO ACHIEVE THE METRIC**

#### 1) Are closeout performance measures tracked and compared over time?

- A number of performance characteristics and resource use data can be tracked over time to show either increased or decreased efficiency, which can allow for adjustments to be made for improvement. Some of those include average daily gain, feed conversion, cost of feed, cost per pound of gain, cost and amount of medication, death loss, and other factors.
- 2) Are rations formulated to optimize resources available to the operation and performance of the cattle?
  - Many variables are considered in formulating cattle diets, including availability of local feedstuffs, cost, transportation, storage, season of the year, and most importantly, the nutritional needs of the cattle in their specific stage of development. Feedyards can feed higher efficiency feedstuffs and can utilize a consulting nutritionist to help balance all of these factors to create a ration that

meets their cattle's nutritional requirements while effectively utilizing natural resources and avoiding unnecessary excess spending.

- 3) Is energy consumption monitored to evaluate efficient utilization per unit of production (kwh/ton, mcf/ton, production cost/ton, or similar measure)?
  - Proper care of cattle requires use of certain fuel sources such as electricity, diesel, natural gas, and propane, etc. to complete tasks that include processing, milling/mixing and delivering feed, and powering water wells and automatic water tanks. Using these resources as efficiently as possible is important both from an efficiency and yield perspective, but also as it relates to air and GHG emissions. Feedyard operators can also track their use of these resources and compare their use to the outcomes of the tasks the resources are used to complete (e.g., gallons of diesel per ton of feed delivered). In tracking this information, the producer can find ways to reduce use, ultimately save money, and protect the environment.
- 4) Are feedstuffs monitored for shrink and storage losses, and are methods improved over time?
  - Storage and feeding losses can range from minimal for dry grain and commodities to more than 20-30% for some silage structures. Feedyards can track inventories and monitor current losses to look for potential improvements in feed storage and feeding efficiency.
- 5) Is efficiency of feed delivery monitored (tons/truck/mile or similar measure)?
  - Good feed bunk management can minimize feeding losses. Planned routes for feed delivery can reduce truck miles, fuel consumption, and maintenance.
- 6) Are financial results for the entity evaluated and compared over time?
  - Businesses of all types must track financial performance in order to stay in operation year after year. This is fundamental to business sustainability. A feedyard operator should be able to compare financial statements and results from a period of time to make improved financial decisions for the operation. Farm feedlots should periodically evaluate the feedlot enterprise separately.
- 7) Is staffing tracked over time (employees/1,000 head of occupancy)?

#### TOOLS AND INFORMATIONAL RESOURCES

The following resources can be helpful to feedyards seeking to improve their operations; it is not intended to be an exhaustive list. USRSB does not own or manage these resources, but they are provided as potential helpful tools for value chain participants.

1) Accounting firms:

- Lewis, Hooper & Dick<sup>178</sup>
- KCOE-ISOM<sup>179</sup>
- 2) Elanco/AgSpan benchmarking service<sup>180</sup>
- 3) Feedlot management software:
  - ISU Beef Feedlot Monitor Software<sup>181</sup>
- 4) Feedyard accounting systems
  - <u>FY3000<sup>182</sup></u>

<sup>&</sup>lt;sup>178</sup>https://www.lhd.com/

<sup>&</sup>lt;sup>179</sup>https://www.kcoe.com/

<sup>&</sup>lt;sup>180</sup>https://www.elanco.us/benchmark

<sup>&</sup>lt;sup>181</sup>https://store.extension.iastate.edu/product/ISU-Beef-Feedlot-Monitor-Software

<sup>&</sup>lt;sup>182</sup>http://www.elynx.com.au/products/fy-3000

- <u>Hi-Plains<sup>183</sup></u>
- Turnkey<sup>184</sup>
- 5) Nutrition groups:
  - <u>NSA<sup>185</sup></u>
  - MWPMS
- 6) <u>PAC group (on veterinarian side)</u><sup>186</sup>
- 7) <u>PCC/AgStrata benchmarking service<sup>187</sup></u>
- 8) University extension services
  - <u>ISU Feedlot Monitor<sup>188</sup></u>

### FEEDYARD SECTOR SUSTAINABILITY ASSESSMENT GUIDE: INDICATOR 3.5: ANIMAL HEALTH AND WELL-BEING

METRIC 3.5: ARE FEEDYARD EMPLOYEES TRAINED IN BEEF QUALITY ASSURANCE (BQA) PRINCIPLES, AND ARE THESE PRINCIPLES IMPLEMENTED AT THE FEEDYARD?

#### DESCRIPTION OF INDICATOR AND METRIC

**USRSB defines Animal Health and Well-being as:** The cumulative effects of cattle heath, nutrition, care, and comfort.

The <u>Beef Quality Assurance program</u><sup>189</sup> (BQA) and its accompanying guidelines cover the major areas of Animal Nutrition, Health, Care, and Handling. Adoption of these scientifically based (Grandin, 2016; Grandin, 2015) practices allows feedyards to produce healthier, lower-stressed animals, which has a significant impact on improving the Framework's Animal Health and Well-being Indicator. These practices are consistent with the World Organization for Animal Health (OIE) code, which provides global standards for animal well-being and beef cattle production systems (OIE, 2017). Moreover, these practices also have an impact on the Employee Safety and Well-being Indicator by advancing low-stress, safe handling techniques, thereby reducing the risk of injury to employees. They also have a secondary impact on the Efficiency and Yield Indicator because the animals perform at a higher level, thereby increasing profitability.

The BQA is the flagship program of the industry's effort to provide voluntary training to producers on animal nutrition, health, care, and handling. State and regional BQA trainings or new online training modules launched in 2017 allow individual certification for producers. In addition to the BQA <u>Cattle</u> Industry Guidelines for Care and Handling of Cattle<sup>190</sup>, there is also a <u>BQA Feedyard Assessment<sup>191</sup></u>

- <sup>186</sup>https://www.pacdvms.com/
- 187http://www.pcc-online.com/
- <sup>188</sup>https://www.extension.iastate.edu/agdm/livestock/html/b1-36.html

<sup>&</sup>lt;sup>183</sup>http://www.hiplainsystems.com/

<sup>&</sup>lt;sup>184</sup>https://www.turnkeynet.com/home

<sup>&</sup>lt;sup>185</sup>https://www.xfent.com/nutrition-services-associates-nsa

<sup>&</sup>lt;sup>189</sup>http://www.bqa.org/

<sup>&</sup>lt;sup>190</sup>https://www.bqa.org/Media/BQA/Docs/cchg2015\_final.pdf

<sup>&</sup>lt;sup>191</sup>https://www.bqa.org/Media/BQA/Docs/feedyard\_assessment\_2017.pdf

available online for producers. It was developed by veterinarians, industry representatives, animal scientists, and extension professionals. It is important to note that the primary step is the implementation of BQA principles, which the metric adequately recognizes. Whether or not a BQA certification is done, improvements in sustainability inevitably come from the implementation of the BQA principles. The assessment is extremely important, as it informs and allows changes or new implementation of BQA principles at the feedyard.

The metric (measurement) for the feedyard Animal Health and Well-being Indicator is captured in a set of primary and supporting assessment questions. The assessment questions are meant to help each feedyard develop their process for quantifying and improving their own animal health and well-being programs.

#### **GUIDANCE TO ACHIEVE THE METRIC**

The following are actions or steps contributing to a sustainable plan in support of the Animal Health and Well-being Indicator and Metric.

- 1) Has the feedyard either become BQA-certified or completed the BQA self-assessment?
  - If "Yes," the feedyard does not need to answer the following questions, as these questions are already covered within the BQA certification or self-assessment.
- 2) Are management/key employees BQA trained or certified?
  - Training is available for feedyard employees online at <u>www.bqa.org</u>. This can also be done through state BQA programs, where available.
- 3) Are all employees receiving BQA training related to their job description and responsibilities?
- 4) Are training and management practices in place to prevent animal neglect or animal abuse?
  - The U.S. beef industry has zero tolerance for animal neglect or animal abuse. All employees must understand and practice proper animal handling techniques at all times.
- 5) Are water, feed, and other necessities provided to all animals?
  - Cattle should be provided with the resources needed to be comfortable, healthy, and content, which can vary depending on season and weather.
- 6) Are management technologies and recordkeeping in place to ensure no risk of an animal being marketed with a violative residue?
  - Feedyards are prohibited by federal law from sending an animal to slaughter that has not reached the withdrawal period established for the specific medication it may have received. In order to ensure this, accurate and thorough recordkeeping is essential so that the feedyard owner and operator know exactly which animals have received medications and when those animals will be cleared to go to market. Protocols to achieve this are covered under the BQA program.
- 7) Is a herd health management protocol established and followed?
- 8) Is a euthanasia protocol established and followed?
  - Referenced in the BQA manual, an excellent resource to assist in developing a euthanasia protocol can be found in the <u>Practical Euthanasia of Cattle Guidelines<sup>192</sup></u>, developed and published by the American Association of Bovine Practitioners.
- 9) Are employees trained in the proper ways to handle cattle in various situations in order to prevent stress and improve well-being?
  - These principles are all covered under the BQA program.

<sup>&</sup>lt;sup>192</sup>http://www.aabp.org/resources/AABP\_Guidelines/Practical\_Euthanasia\_of\_Cattle-September\_2013.pdf

#### 10) Is a non-ambulatory animal handling protocol established and followed?

 Employees must be trained in the proper ways to handle cattle in various situations to prevent stress and improve well-being of the cattle. These principles are all covered under the BQA program.

#### 11) Is an antibiotic stewardship protocol established and followed?

- Please reference the Veterinarian-Client-Patient Relationship (VCPR) and <u>Antibiotic Stewardship</u> section of this SAG.
- Good herd health management begins with disease prevention, followed by treatment if necessary. The effectiveness of disease prevention is impacted by every facet of feedyard management.
- Properly treating sick cattle, separating them from the herd, and sanitarily disposing of carcasses in the unfortunate event of cattle death are all critical factors in maintaining optimal herd health.
- 12) Is a biosecurity protocol facility established and followed for the facility?
  - Biosecurity is a set of practices employed to prevent the importation of infectious organisms into a herd or flock and their transmission between animals. <u>Penn State Extension<sup>193</sup></u>, <u>University of</u> <u>Tennessee<sup>194</sup></u>, and <u>USDA-APHIS<sup>195</sup></u> provide some resources and guidelines of what a biosecurity protocol is and how to develop one. Biosecurity protocols to prevent the spread of disease and to keep outside illnesses from reaching a facility are crucial to keeping cattle healthy.
- 13) Is a pen surface maintenance protocol established and followed?

#### 14) Is a carcass disposal and removal protocol established and followed?

- Proper carcass disposal has an impact on overall biosecurity and disease control. A protocol should include procedures for employees to follow in reporting carcasses to management, for moving carcasses to an area away from live animals, and covering carcasses until proper disposal is completed.
- 15) Are medication inventory, storage, and handling protocols established and followed by all employees who handle pharmaceutical products?
- 16) Is a broken needle policy and recordkeeping protocols established, and are all employees trained accordingly?
  - Broken needles are a major food safety and quality issue. Under the BQA program, the number of cases of broken needles have been reduced drastically, and improved injection practices when treating cattle have caused less meat to be impacted.
- 17) Are Veterinary Feed Directives (VFDs) in place for required medicated feeds, with handling and inventory protocols as prescribed?
  - The U.S. Food and Drug Administration's (FDA) VFD requires feedyard operators to receive a written prescription from a veterinarian whenever antibiotics important to human health are to be used in feed or water of cattle affected by an ailment. Feedyard operators must keep these records, and in the event of an FDA audit, they must show compliance.
- 18) Are animal feed ingredient quality and safety monitoring protocols established and followed?
- 19) Is documentation maintained verifying no ruminant-derived protein sources are received or fed on the premises?

<sup>&</sup>lt;sup>193</sup>https://extension.psu.edu/biosecurity-a-practical-approach

<sup>&</sup>lt;sup>194</sup>https://extension.tennessee.edu/publications/Documents/SP604.pdf

<sup>&</sup>lt;sup>195</sup>https://www.aphis.usda.gov/animal\_health/emergency\_management/downloads/documents\_manuals/cow-calf\_industrymanual.pdf

- Feedyard operators are prohibited from feeding any animal byproducts derived from ruminant animals to their cattle. This policy was established by the federal government in an effort to eliminate the risk of U.S. cattle contracting Bovine Spongiform Encephalopathy (BSE). Because of this policy and others strictly followed by U.S. beef producers, the U.S. is recognized as a negligible risk for BSE by the OIE, the highest safety level the organization bestows.
- 20) Is protocol established and are employees trained on minimizing use of electric prods when handling cattle?
  - Under desirable conditions, cattle should flow through cattle handling systems without the use of electric prods. For safety and well-being reasons, feedyards should minimize the use of electric prods. Non-electric driving aids, such as plastic paddles, sorting sticks, flags, or streamers (affixed to long handles) should be used to quietly guide and turn animals. When cattle continuously balk, handlers should investigate and correct the reason for the balking rather than resort to overuse of electric prods.
- 21) Are floor surfaces monitored and maintained to minimize risk of slipping, stumbling, and falling by cattle in handling areas?
  - This is not only important for the cattle moving through a facility but also for the employees working in the facility. Good traction on wet/slippery surfaces is an important safety consideration.
- 22) Are low-stress cattle handling techniques practiced?
  - Cattle are naturally prey animals that react in unique ways to various handling techniques that may seem counterintuitive to people unfamiliar with their natural instincts. Employees should be trained on how to properly handle cattle in a way that supports their natural instincts. This training is available through the BQA program.
- 23) Are equipment, pens, gates, and chutes, etc. monitored and repaired when any potential injury causing issue is detected?
- 24) Do animals have adequate space to stand, lie down, and move freely around their pens?
  - Cattle at the feedyard should have sufficient space in their pens for not only safety, but comfort.
     Comfortable cattle will practice normal behaviors such as eating and drinking regularly, chewing their cud, resting, and socializing with other animals. These factors have a significant impact on animal health and well-being.
- 25) Are pens managed to minimize mud?
- 26) Are water tanks managed to provide clean, fresh water to cattle at all times?
- 27) Are feed bunks managed to eliminate mold, manure, and debris and to provide fresh feed daily?
  - Feedyard operators are very concerned about the quality of feed and water they provide to their cattle. When the best, freshest feed and water are offered, cattle are more likely to eat, drink, and perform well.
- 28) Is recordkeeping in place to retain records for the required number of years stated in the BQA guidelines?

#### PROVIDE DISEASE PREVENTION PRACTICES TO PROTECT HERD HEALTH

Like other species, cattle are susceptible to infectious diseases, metabolic disorders, toxins, parasites, neoplasia, and injury. Control programs based on risk assessment and efficacy of available products are generally most effective. Economic losses are reduced through health management programs which include early intervention and preventative practices and lead to increased animal health and well-being.

Healthy cattle are more productive. Management programs should be science-based, common-sense driven, and include general animal health products (e.g., vaccines, vitamins, parasite control products, etc.), along with antibiotics when necessary, meeting rules and regulations. Working with a veterinarian to determine the risk of infectious, metabolic, and toxic diseases and to develop effective management programs when designing a herd health plan can help ensure the appropriate plan is developed for the operation and will assist in incorporation of appropriate new technologies and products. A Veterinary-Client-Patient Relationship (VCPR) is strongly encouraged (AABP, 2013b) overall and in some states, like California, a VCPR is required to purchase and administer antibiotics.

#### VETERINARIAN-CLIENT-PATIENT RELATIONSHIP (VCPR)

The VCPR is the basis for interaction among veterinarians, their clients (producers), and their patients (cattle) and is critical to cattle health and well-being. There is a federal definition for a VCPR and state definitions for VCPRs exist under state veterinary practice acts. The FDA has identified <u>a list of the VCPR</u> <u>jurisdiction<sup>196</sup></u> for the respective state or federal definition in reference to the VFD. The VFD is part of full compliance with FDA Guidance <u>209<sup>197</sup></u> and <u>213<sup>198</sup></u> that requires veterinary oversight of all medically important antibiotics used to improve or maintain animal health and well-being.

The BQA program describes the VCPR as the following:

"In general, a VCPR exists when:

- The veterinarian has assumed the responsibility for making clinical judgments regarding the health of the animal and the need for medical treatment, and the client has agreed to follow the veterinarian's instructions.
- 2) The veterinarian has sufficient knowledge of the animal to initiate at least a general or preliminary diagnosis of the medical condition of the animal. This means the veterinarian has recently seen and is personally acquainted with the keeping and care of the animal by virtue of an examination of the animal or medically appropriate and timely visits to the premises where the animal is kept.
- 3) The veterinarian is responsible for maintaining and evaluating case and treatment records and is readily available for follow-up evaluation in the event of adverse reactions or failure of the treatment regimen."

Producers and their employees need to have the training and/or experience to recognize common health problems and know how to properly utilize animal health products and other control measures. When prevention or control measures are ineffective, the producer should promptly contact a veterinarian for a diagnosis and treatment program to reduce animal suffering and animal losses.

#### ANTIBIOTIC STEWARDSHIP

Antibiotic stewardship encompasses common sense practices adopted and committed to by beef producers including good recordkeeping, emphasizing herd health to ensure animal health and well-being, responsible treatment of sick animals and protocols to ensure animals are not marketed with violative antibiotic residues. The producer, packer, and consumer all benefit from healthy cattle in the beef value chain. Positive outcomes of antibiotic stewardship are increased trust and transparency with the end

<sup>&</sup>lt;sup>196</sup>http://www.fda.gov/AnimalVeterinary/ DevelopmentApprovalProcess/ucm460406.htm

 <sup>&</sup>lt;sup>197</sup>https://www.fda.gov/downloads/AnimalVeterinary/GuidanceComplianceEnforcement/GuidanceforIndustry/UCM216936.pdf
 <sup>198</sup>https://www.fda.gov/downloads/AnimalVeterinary/GuidanceComplianceEnforcement/GuidanceforIndustry/UCM299624.pdf

consumer that can translate into increased demand for beef while ensuring animal health, food safety, and security.

Antibiotics are extremely valuable tools for preventing, treating, and controlling disease in all livestock production. Ability to effectively prevent, treat, and control diseases in cattle directly results in improved animal health and well-being. Additionally, currently available technologies cannot yet replace antibiotics from an effectiveness standpoint. However, the USRSB supports continuing research for antibiotic alternatives. Maintaining the efficacy of antibiotics is a highly complex issue, affecting both human and animal health, and it is a top priority for cattle producers. Antibiotic resistance occurs when bacteria develop the ability to defeat the drugs designed to kill them (CDC Antibiotic Resistance Questions and Answers<sup>199</sup>). The responsible and judicious use of antibiotics is one key to addressing this concern.

Separately, a violative antibiotic residue is defined as the presence of veterinary drugs in meat. These residues are usually measured in parts per million or parts per billion. Avoiding violative antibiotic residues has been an important BQA principle for cattle production since the creation of the BQA program<sup>200</sup> more than three decades ago. The BQA program tools are the result of years of scientific research and practical experience and are continually updated to provide the latest in animal management information and technologies. Avoiding residues remains a top priority for the cattle industry today. The prevention of violative antibiotic residues is a continuous, coordinated effort between government agencies, veterinarians, and livestock producers that begins before the antibiotic is ever used in animals. The drug approval process, on-farm judicious use of antibiotics, and the U.S. National Residue Program are all specifically designed to prevent animal products with violative drug residues from entering the food supply. The FDA also sets withdrawal times for all veterinary drugs, including antibiotics. Practically, the withdrawal time is the amount of time required for the drug to be reduced to a safe tolerance level. The final step in protecting and preventing violative antibiotic residues from entering the food supply is surveillance testing conducted by the United States Department of Agriculture (USDA) Food Safety Inspection Service (FSIS). The overwhelming majority of meat products contain no residues or residues within the government prescribed tolerance levels. If beef is found with violative antibiotic residues, it is removed from the food chain and discarded.

A complete cattle health program will include the judicious use of antibiotics, documented by on-farm recordkeeping and adhering to the following BQA 14 Judicious Use Guidelines detailed in the <u>BQA</u> <u>Antibiotics Stewardship for Beef Producers guidebook<sup>201</sup></u>. The guidelines are developed from the American Veterinary Medical Association (AVMA), American Association of Bovine Practitioners (AABP), and Academy of Veterinarian Consultants (AVC) guidance on appropriate Veterinary Antibiotic Use and are updated systematically to stay aligned with current guidance.

- 1) **Prevent problems:** Emphasize appropriate husbandry and hygiene, routine health examinations, and vaccinations.
- 2) Adhere to FDA guidance: Follow label instructions and FDA guidance for the use of all antibiotics. The use of antibiotics medically important in human medicine should only be used after careful consideration. If medically important feed grade antibiotics are used, they must be under the guidance of a Veterinary Feed Directive (VFD).

<sup>&</sup>lt;sup>199</sup>https://www.cdc.gov/antibiotic-use/community/about/antibiotic-resistance-faqs.html
<sup>200</sup>https://www.bqa.org/

<sup>&</sup>lt;sup>201</sup>https://www.bqa.org/Media/BQA/Docs/bqa\_antibiotics\_final.pdf

- 3) Select and use antibiotics carefully: Consult with your veterinarian on the selection and use of antibiotics under the premise of a valid Veterinarian-Client-Patient-Relationship (VCPR). Have a valid reason to use an antibiotic. Appropriate therapeutic alternatives should be considered prior to using antimicrobial therapy.
- 4) Use the laboratory to help you select antibiotics: Cultures and sensitivity test results should be used to aid in the selection of antibiotics, whenever possible.
- 5) **Combination antibiotic therapy is discouraged unless there is clear evidence that specific practice is beneficial:** Select and dose an antibiotic to affect a cure.
- 6) **Avoid inappropriate antibiotic use:** Confine therapeutic antibiotic use to appropriate clinical indications, avoiding inappropriate uses such as for viral infections without bacterial complication.
- 7) **Treatment programs should reflect Best Use Principles:** Regimens for therapeutic antimicrobial use should be optimized using current pharmacological information and principles.
- 8) Treat the fewest number of animals possible: Limit antibiotic use to sick or at-risk animals.
- 9) **Treat for the recommended time period:** To minimize the potential for bacteria to become resistant to antimicrobials.
- 10) Avoid environmental contamination with antibiotics: Steps should be taken to minimize antimicrobials reaching the environment through spillage, contaminated ground run off or aerosolization.
- 11) Keep records of antibiotic use: Accurate records of treatment and outcome should be used to evaluate therapeutic regimens and always follow proper meat and milk withdrawal times. Keep records for a minimum of 2 years or longer based on state and local regulations.
- 12) **Follow label directions:** Follow label instructions and never use antibiotics other than as labeled without a valid veterinary prescription.
- 13) **Extra-label antibiotic use must follow FDA Regulations:** Prescriptions, including extra label use of medications must meet the Animal Medicinal Drug Use Clarification Act (AMDUCA), amendments to the Food, Drug, and Cosmetic Act and its regulations. This includes having a valid VCPR.
- 14) Medically Important Antibiotic Use Should be Limited to Treat, Prevent or Control Disease: Medically important antibiotics should not be used if the principle intent is to improve performance. Antibiotics that are medically important to human medicine may not be used for performance.

Feedyards have a moral and ethical responsibility to ensure, to the best of their ability, the health and well-being of the livestock in their care. Management programs that provide disease prevention practices, including the judicious use of antibiotics, are extremely important tools that ensure cattle health and well-being in the Feedyard Sector.

#### PROVIDE APPROPRIATE TRANSPORTATION FOR THE CATTLE

The national BQA manual details cattle transportation guidelines, including:

- 1) Cattle sorting and holding pens should allow handling without undue stress, be located near the loading/unloading facility, and be suitable for herd size.
- 2) Properly designed and maintained loading facilities should be provided for easy and safe animal movement. Proper design of loading chutes, as well as personnel who are knowledgeable of the chutes' proper use, can assure the safety of both cattle and cattle handlers. Ramps and chutes should be strong and solid, provide nonslip footing, and have sides high enough to keep cattle from falling or jumping off. A ramp angle of 25 degrees or less will improve cattle movement.
- 3) All vehicles used to transport cattle should provide for the safety of personnel and cattle during loading, transporting, and unloading.

- 4) Strict adherence to safe load levels regarding animal weight and space allocation is critical.
- 5) Producers hauling cattle in farm and ranch trailers must ensure that adequate space is provided so that cattle have sufficient room to stand with little risk of being forced down because of overcrowding.
- 6) Cattle that are unable to withstand the rigors of transportation should not be shipped.
- 7) When a vehicle is not full, cattle should be safely partitioned into smaller areas to provide stability for the cattle and the vehicle.
- 8) Knowingly inflicting physical injury or unnecessary pain on cattle when loading, unloading, or transporting animals is not acceptable.
- 9) No gap that would allow injury to an animal should exist between the ramp, its sides, and the vehicle.
- 10) Vehicle doors and internal gates should be sufficiently wide to permit cattle to pass through easily without bruising or injury.

<u>Additional details can be found in the BQA Transportation Quality Assurance Program<sup>202</sup></u>. Also, the BQA Transportation (BQAT) online training is available <u>here<sup>203</sup></u>.

#### TOOLS AND INFORMATIONAL RESOURCES

The following list of resources can be helpful to feedyards seeking to improve their operations; it is not intended to be an exhaustive list. USRSB does not own or manage these resources, but they are provided as potential helpful tools for value chain participants.

- 1) Land grant universities and extension services
  - Colorado State University
  - Iowa State University
  - Kansas State University (KSU) Beef Cattle Institute<sup>204</sup>
  - Oklahoma State University
  - Texas A&M University (TAMU)
  - Texas Tech University
  - University of Missouri
  - University of Nebraska-Lincoln
  - West Texas A&M University
- 2) State cattlemen's organizations' BQA programs
  - BQA training and certification resources are readily available in all states through on-line training or in-person training opportunities. Visit <u>BQA<sup>205</sup></u> for more information.

### FEEDYARD SECTOR SUSTAINABILITY ASSESSMENT GUIDE INDICATOR 3.6: EMPLOYEE SAFETY AND WELL-BEING

<sup>&</sup>lt;sup>202</sup>https://www.bqa.org/Media/BQA/Docs/master\_cattle\_transporter\_guide-digital.pdf

<sup>&</sup>lt;sup>203</sup>https://bqatransportation.beeflearningcenter.org/

<sup>&</sup>lt;sup>204</sup>https://ksubci.org/

<sup>&</sup>lt;sup>205</sup>https://www.bqa.org/

## METRIC 3.6: ARE FEEDYARD EMPLOYEES TRAINED AND IS AN EMPLOYEE SAFETY PROGRAM IMPLEMENTED AT THE FEEDYARD?

#### DESCRIPTION OF INDICATOR AND METRIC

**USRSB defines Employee Safety and Well-being as:** The implementation of safety programs and training to provide a safe workplace and help to prevent workplace accidents and injuries associated with production, processing, and distribution of beef and the relative prosperity of workers employed in those activities.

Making an employee safety program a priority at a feedyard has the dual benefit of protecting the safety and improving the well-being of those employed at the feedyard, as well as reducing stress and potential injury to cattle, thereby improving the Animal Health and Well-being Indicator. As with other sectors that handle and care for the cattle daily, reduction in animal stress and injury improves animal performance and in turn improves profitability under the Efficiency and Yield Indicator.

Safety training programs for feedyard members are broadly available; several state cattlemen's associations provide their members with sector-specific safety training. These associations assist feedyards with development of written safety programs, conduct safety inspections, and provide inperson training to feedyard employees. Many such resources are available to aid in the development of an individual operation's safety program. Workers' compensation insurance providers also have personnel to help enhance on-site safety programs. Companies that have, and actively support, safety programs can enhance the safety performance of their employees (Christian, et. al., 2009).

Employee well-being can be broadly defined as the aspects that factor into the structure of the job role as well as the employees' perception of their work environment (Chenoweth, 2014). Practices that companies can implement to support employees in their job and in their family life can pay off in terms of employee engagement, reducing turnover, and improving productivity. A more engaged employee is also a safer employee. Engagement, safety, and productivity all also contribute to the Efficiency and Yield Indicator for the operation (Wallace & Chen, 2006).

#### **GUIDANCE TO ACHIEVE THE METRIC**

The following are actions or steps contributing to a sustainable plan in support of the Employee Safety and Well-being Indicator and Metric.

#### **EMPLOYEE SAFETY PROGRAM**

- 1) Does the feedyard participate in an employee safety program provided by an insurance/workers' compensation program, association, or consultant that is inclusive of a written plan, safety inspections, employee training, recordkeeping, and reporting?
  - If "Yes," the feedyard does not need to answer the following questions in this section, as these
    questions will already be covered in the employee safety program.
- 2) Is a written employee safety plan provided to all employees?
  - Each feedyard should have a written plan with policies and procedures specific to that facility to
    ensure employees know how to best carry out their job duties in the safest way possible.
- 3) Are routine safety meetings held?
  - Since safety practices are always evolving and improving, routine meetings should be held to keep employees up-to-date and refreshed on the latest policies and procedures.

- 4) Are periodic safety audits performed?
  - Having an outside entity analyze the effectiveness of a feedyard's safety program on a regular basis helps to troubleshoot potential problems and continually improve employee safety.
- 5) Are accidents documented and/or investigated in-house and reported to the U.S. Department of Labor's Occupational Safety and Health Administration (OSHA) if required?
  - One key to improving safety is investigating when accidents do happen and figuring out how to prevent the same thing from happening in the future.
- 6) If liquid manure is handled as a slurry in an enclosed area or pit, do employees use and have training on hydrogen sulfide gas detectors?

#### EMPLOYEE BENEFITS AND COMMUNITY ACTIVITY

- 7) Are employee benefits packages provided to full-time employees?
  - Employee benefits are important to employee well-being. What each feedyard is able to provide may depend on size and resources as well as the number of full-time employees. Some feedyards have hundreds of employees, while others have less than five. In some cases, the feedyard owner/operator may be the sole employee. Therefore, practical employee benefits will vary greatly across the Feedyard Sector.
- 8) Is employer-sponsored health care included in the benefits package to full-time employees?
- 9) Is an employer-sponsored retirement program (401K, profit share, etc.) included in the benefits package to full-time employees?
- **10)** Is financial counseling available, at least annually, to employees participating in a retirement program?
- 11) Does the company provide and encourage use of vacation time or paid time off?
- 12) Does the company provide employee immunizations (e.g., flu shots) if desired?
- 13) Is smoking discouraged and/or smoking cessation programs encouraged for all employees?
- 14) Does the company sponsor community activities and encourage employee involvement in these community activities?
  - Feedyards are valued business members of their local communities. Feedyards should strive to be good neighbors; however, the way this is achieved may vary greatly depending on resources and location.

#### TOOLS AND INFORMATIONAL RESOURCES

The following resources can be helpful to feedyards seeking to improve their operations; it is not intended to be an exhaustive list. USRSB does not own or manage these resources, but they are provided as potential helpful tools for value chain participants.

- 1) Great Plains Center for Agricultural Health<sup>206</sup>
- 2) Society for Human Resource Management<sup>207</sup>
- 3) State cattlemen's organizations' safety programs
  - Kansas Livestock Association
  - Nebraska Cattlemen's Association
  - Texas Cattle Feeders Association

<sup>206</sup> https://www.public-health.uiowa.edu/gpcah/

<sup>&</sup>lt;sup>207</sup>https://www.shrm.org/

4) Workers' compensation providers

#### REFERENCES

- AABP. 2013. Prudent Antimicrobial Use Guidelines for Cattle. *American Association of Bovine Practitioners*. (2013). Retrieved from <u>http://www.aabp.org/resources/aabp\_guidelines/AABP\_Prudent\_Antimicrobial\_Use\_Guidelines-</u>2013.pdf
- Broocks, A., Rolf, M., & Place, S. (2016). Fact Sheet [Do growth promotants reduce environmental impact?]. *Oklahoma State University.*
- Capper, J. L. (2011). The Environmental Impact of Beef Production in the United States: 1977 compared with 2007. *Journal of Animal Science*, 89(12), 4249-4261.
- Capper, J. L., and D. J. Hayes. (2012). The environmental and Economic Impact of Removing Growth-Enhancing Technologies from U. S. Beef Production. *Journal of Animal Science*, 90, 3527-3537.
- Chenoweth, D., (2014). Promoting Employee Well-being [SHRM Foundation's Effective Practice Guidelines Series]. Retrieved from <u>https://www.shrm.org/hr-today/trends-and-forecasting/special-reports-and-expert-views/Documents/Promoting-Employee-Wellbeing.pdf</u>
- Christian, M. S., Gradley-Geist, J. C., Wallace, C., Burke, M. (2009). Workplace safety: A meta-analysis of the roles of person and situation factors. *Journal of Applied Psychology*, 94(5), 1103-1127.
- Cooprider, K. L., Mitloehner, F. M., Famula, T. R., Kebreab, E., Zhao, Y., & Van Eenennaam, A. L. (2011). Feedlot efficiency implications on greenhouse gas emissions and sustainability. *Journal of Animal Science*, 89,2643-2656.
- Grandin, T., (2015). Improving Animal Welfare. A Practical Approach. 2<sup>nd</sup> Ed. *Department of Agriculture. Colorado State University.*
- Grandin, T., (2016). Evaluation of the Welfare of Cattle Housed in Outdoor Feedlot Pens. *Veterinary and Animal Science*, 1, 23-28.
- Koelsch, R. (2006). Evaluating Livestock System Environmental Performance with Whole-Farm Nutrient Balance. *Journal of Environmental Quality.* 34, 149-155.
- Llonch, P., Somarriba, M., Duthie, C. A., Haskell, M. J., Rooke, J. A., Troy, S., & Turner, S. P. (2016). Association of Temperament and Acute Stress Responsiveness with Productivity, Feed Efficiency, and Methane Emissions in Beef Cattle: An Observational Study. *Frontiers in Veterinary Science*, (Vol.3, pp43). Retrieved from <a href="http://doi.org/10.3389/fvets.2016.00043">http://doi.org/10.3389/fvets.2016.00043</a>
- Montes, F., Meinen, R., Dell, C., Rotz, A., Hristov, A. N., Oh, J., Waghorn, G., Gerver P. J., Henderson, B., Makkar, H. P. S., & Dijkstra, J. (2013). Special Topics – Mitigation of methane and nitrous oxide emissions from animal operations: II. A review of manure management mitigation options. *Journal* of Animal Science. (Vol. 91, 5070- 5094).
- NPDES. 2017. Animal Feeding Operations (AFOs). *National Pollutant Discharge Elimination System*. (2017). Retrieved from <a href="https://www.epa.gov/npdes/animal-feeding-operations-afos">https://www.epa.gov/npdes/animal-feeding-operations-afos</a>
- OIE. 2017. Terrestrial Animal Health Code [Chapter 7.9. Animal Welfare and Beef Cattle Production Systems]. (2017). Retrieved from http://www.oie.int/index.php2id=169&L=0&htmfile=chapitre.aw.beef.cattbe.htm

http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre\_aw\_beef\_catthe.htm

 Pagani, A., Sawyer, J. E., & Mallarino, A. (2013). Site-Specific Nutrient Management: For Nutrient Management Planning to Improve Crop Production, Environmental Quality, and Economic Return (pp. 116). *Extension and Outreach Publications*. Retrieved from <a href="http://lib.dr.iastate.edu/extension\_pubs/116">http://lib.dr.iastate.edu/extension\_pubs/116</a>

- Place, S. E., & Mitloehner, F. M. (2014). The Nexus of Environmental Quality and Livestock Welfare. *The Annual Review of Animal Biosciences*, 2,555-569 10
- Schlegel, A.J., Assefa, Y., Bond, H.D., Wetter, S.M., & Stone, L.R. (2015). Corn response to long-term applications of cattle manure, swine effluent, and inorganic nitrogen fertilizer. *Agron. J*, (107,1701-1710).
- Schlegel, A.J., Assefa, Y., Bond, H.D., Wetter, S.M., & Stone, L.R. (2015). Soil Physicochemical Properties after 10 Years of Animal Waste Application. *Soil Sci. Soc. Am. J.*, (Vol. 79, p711-719).
- Stackhouse-Lawson, K.R., C.A. Rotz, J.W. Oltjen, F.M. Mitloehner. (2012). Growth-promoting technologies decrease the carbon footprint, ammonia emissions, and costs of California beef production systems. *Journal of Animal Science*. (Vol. 90,4 pp656–4665)
- Stackhouse-Lawson, K.R., Calvo, M.S., Place, S.E., Armitage, T.L., Pan, Y., Zhao, Y., Mitloehner, F.M. (2013). Growth promoting technologies reduce greenhouse gas, alcohol, and ammonia emissions from feedlot cattle. *Journal of Animal Science*, (Vol. 91, pp5438–5447).
- USDA. 2018. Cattle on Feed Monthly Report [February 2018]. U.S. Department of Agriculture. (2018). Retrieved from

https://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1020

- Waldrip, H.M., Cole, N.A., & Todd, R.W. (2015). Review: Nitrogen sustainability and beef cattle feedyards: II. Ammonia emissions. *Prof. Anim. Sci.* (Vol.31, pp395-411).
- Wallace, C., & Chen, G. (2006). A multilevel integration of personality, climate, self-regulation, and performance. *Personnel Psychology*. (Vol.59, pp 529-557).

# U.S. BEEF INDUSTRY SUSTAINABILITY FRAMEWORK: 4. PACKER AND PROCESSOR SECTOR

OVERVIEW OF U.S. PACKER AND PROCESSOR SECTOR	89
PACKER AND PROCESSOR SECTOR SUSTAINABILITY ASSESSMENT GUIDES (SAG) Continuous Improvement Strategy	<b>90</b> 91
SAG FOR INDICATOR 4.1 WATER RESOURCES	92
Description of Indicator and Metrics	
Level 1 Metric	93 02
Level 2 Metrics	95 ۵۸
Guidance to Achieve the Metrics	
Level 3 Metrics	
Guidance to Achieve the Metrics	94
Tools and Informational Resources	94
SAG FOR INDICATOR 4.2 LAND RESOURCES	95
Description of Indicator and Metrics	95
Level 1 Metric	95
Guidance to Achieve the Metric	95
SAG FOR INDICATOR 4.3 AIR AND GREENHOUSE GAS EMISSIONS	96
Description of Indicator and Metrics	96
Level 1 Metric	97
Guidance to Achieve the Metric	97
Level 2 Metric	
Guidance to Achieve the Metric	
Level 3 Metrics	9898 مە
Guidance to Achieve the Metrics	
SAG FOR INDICATOR 4.4 EFFICIENCY AND YIELD	99
Description of Indicator and Metrics	
Level 1 Metric	
Guidance to Achieve the Metric	101
Guidance to Achieve the Metric	101
Level 3 Metrics	
Guidance to Achieve the Metrics	
Tools and Informational Resources	
SAG FOR INDICATOR 4.5 ANIMAL HEALTH AND WELL-BEING	
Description of Indicator and Metrics	
Level 1 Metrics	

Guidance to Achieve the Metrics	
Level 2 Metrics	
Guidance to Achieve the Metrics	
Level 3 Metrics	
Guidance to Achieve the Metrics	
Tools and Informational Resources	
SAG FOR INDICATOR 4.6 EMPLOYEE SAFETY AND WELL-BEING	106
Description of Indicator and Metrics	
Level 1 Metric	
Guidance to Achieve the Metric	
Level 2 Metric	
Guidance to Achieve the Metric	
Level 3 Metrics	
Guidance to Achieve the Metrics	
Tools and Informational Resources	
REFERENCES	

### **OVERVIEW OF U.S. PACKER AND PROCESSOR SECTOR**

The Packer and Processor Sector is made up of organizations and facilities that process, package, and distribute beef. The U.S. is the world's largest producer of beef, primarily high-quality, grain-fed beef for domestic and export consumption. In 2018, U.S. beef production (commercial carcass weight) was more than 26 billion pounds, and U.S. commercial slaughter was almost 33 million head (LMIC, 2018b). Beef is exported from the U.S. to more than 130 countries (USDA, 2017b). Today, about 14% of U.S. beef is exported, with the largest U.S. beef importers being Japan, Canada, Mexico, and South Korea (USDA, 2017a). The U.S. is a net beef importer; predominantly for further processing in the country.

The USRSB also recognizes the important contribution to the beef supply from the dairy industry, both the through fed cattle supply and from cull cows. The Innovation Center for U.S. Dairy has a strong sustainability program for dairy producers which applies until the animal enters the Packer and Processor Sector. Once reaching this stage, the U.S. Beef Industry Sustainability Framework indicators and metrics apply. Of the 33 million head harvested in 2018, 9% were dairy cows and 9% were beef cows (LMIC, 2018a).

In the fed-beef system, after being fed at feedyards for four to six months, live cattle are transported to meat packing plants for primary processing (slaughter). Cattle typically arrive at meat packing plants when they are 18-24 months of age. After slaughter, the carcass is processed into beef products. At some sites, beef will be boxed and shipped directly to retail customers, and in other cases, beef will be shipped to other processing plants before reaching retail or food service customers.

Most packing plants in the U.S. are relatively small in size; 92% of plants slaughter less than 50,000 head per year (USDA, 2018). However, large plants with capacity of more than 50,000 head account for the vast majority of cattle slaughter. The large plants accounted for 96.5% of cattle slaughtered in 2017 (USDA, 2018). Due to the efficiencies of scale inherent in operating multiple large plants, four major companies dominate the packing market. Together, the four leaders account for more than 85% of fed cattle

slaughter (Figure 1) (Cattle Buyers Weekly, 2017). Cattle feeding is located predominantly in the Central Plains regions of the country. As a result, large packers have built plants near these regions. The top four packing states are Nebraska, Kansas, Texas, and Colorado. Together, they account for approximately 70% of cattle slaughter in 2017 (USDA, 2018).



Figure 1: Proportion of U.S. fed beef slaughtered by major packing companies in the U.S. (Cattle Buyers Weekly, 2017).

Beef processing uses resources, such as water, land, energy, packaging materials, chemicals, refrigerants, etc., and these can have impacts on the environment. According to the National Cattlemen's Beef Association (NCBA ,2017), 2.6% of the carbon dioxide emissions ( $CO_2e$ ) emissions from beef production occur during beef processing (1.6% from harvest and 1% from case ready). Consequently, processing plants must manage these resources and impacts responsibly. For example, processing plants use water for food safety and sanitation purposes, so facilities must manage water use and water quality. Similarly, harvest facilities handle live cattle; therefore, they must have detailed animal welfare policies and practices in place.

It is important for this sector to share its story. Even beyond this Framework, USRSB encourages packers and processors to publicly discuss the innovative and creative activities that a facility or an entire company has engaged in that will improve the sustainability of the beef industry.

### PACKER AND PROCESSOR SECTOR SUSTAINABILITY ASSESSMENT GUIDES

The following Sustainability Assessment Guides (SAGs) offer self-assessment tools for each of the six highpriority indicators, which allow companies to assess their own operations in order to gain a perspective of where they fall on the continuum of the sustainability spectrum and allow for measurable maintenance and/or improvement across the indicators.

The following SAGs describe and define the metrics for each of the six high-priority sustainability indicators. The SAGs also include resources and tools which will assist individual operators in assessing their own operations and identifying and implementing opportunities for improvement as it relates to the sustainability indicators. Importantly, adoption and use of the methods and tools described in the SAGs is voluntary. The SAGs are primarily intended to assist operators in improving a wide range of outcomes on their operations over time.

For each of the six high-priority indicators, the SAG will include:

- 1) A description of the indicator to ensure a clear understanding of its intent
- 2) A description of the metric selected to measure the indicator
- 3) Supporting guidelines that elaborate on the context of the metric, including guidelines to address various elements of the metric
  - It is important to note:
    - i) Individual operators may or may not be addressing all the items asked in the supporting guidelines for a particular metric
    - ii) Knowing what some of these additional elements are creates the opportunity for that operator to consider addressing those items going forward
    - iii) Action on the part of the operator to address the listed items, or other items, over time is a means of demonstrating continuous improvement
- 4) Resources for implementation (not meant to be an exhaustive list), including:
  - Recommended practices for improving a particular metric
  - Summary of existing information for that metric
  - Tools (software, apps, hardware, etc.), for supporting metric assessment
  - Case studies
  - Technical support information
- 5) Suggested methods to monitor change and/or progress over time

A key tenet of sustainability is managing any operational task to strive toward **continuous improvement**. As this self-assessment is worked through on an operation, the guidelines below should be considered, and implementation planned in accordance with individual operation environments, situations, and needs. Methods to monitor change and/or progress over time also need to be identified. Incorporating guidelines, such as those identified in this SAG, into routine process reviews will potentially improve both the efficiency and sustainability of the operation.

#### CONTINUOUS IMPROVEMENT STRATEGY

For the Packer and Processor Sector, the continuous improvement strategy is embedded within the design of the metrics. Continuous improvement implies that the sector, or companies in the sector, regularly attain greater knowledge about their sustainability impacts, as well as, continuously developing and applying that knowledge, skills, and tools to improve their impacts. Therefore, the metrics are designed to be progressive with three levels.

In these SAGs' documents, Level 1 typically implies that the company has a program to address the indicator at the facility level. This suggests that company has addressed the impact and implemented at least some resources to address that impact. Level 2 is results-oriented and looks for quantifiable impacts at the facility level, which implies that the company is monitoring and measuring its impacts. Monitoring and measuring are critical to allow for continuous improvement. Finally, Level 3 looks to the future at the facility and/or company level – is the company setting goals and targets for improvement, as well as working with other industry stakeholders to improve upon the indicator? If a company answers "yes" to any of the questions in each metric, this does not mean the end of the sustainability journey has been reached. It simply means that the organization is ready to move to the next challenge of continuous improvement, and the SAGs' documents can help advise upon the next steps.

When a company chooses to benchmark and monitor the indicator, the company should also monitor the quantitative direction the indicator is trending, with a goal of improvement (e.g., for levels of emissions-related monitoring, downward data trends would be the goal). The levels are cumulative; if a company

were to assess itself or go through a second- or third-party assessment, the company would need to achieve Level 1 and 2 before it qualifies as Level 3. The approach will drive continuous improvement in the Packer and Processor Sector.

### PACKER AND PROCESSOR SECTOR SUSTAINABILITY ASSESSMENT GUIDE: INDICATOR 4.1: WATER RESOURCES

METRICS 4.1 WATER RESOURCES	
Level 1	4.1.1 Is a water resource management plan implemented at the facility?
Level 2	4.1.2a How many wastewater permit non-compliances has the facility had in the previous calendar year?
	4.1.2b What is the water use in gallons/head/day (packers), or gallons/pounds of beef processed (processors)?
Level 3	4.1.3a Does the company track discharge water quality over time?
	4.1.3b Does the company have set goals for continued improvement?
	4.1.3c Does the company make water performance efforts public?
	4.1.3d Does the company participate in partnerships, initiatives, or programs to
	further advance water resource management?

**USRSB defines Water Resources as:** The volume of water used by a sector for each process, and any impacts on water quality by a sector for each process.

Suggested Frequency of Assessment: At least annually.

**Responsible Party:** Level 1 and 2 metrics are facility; Level 3 metrics are required at a corporate and/or facility level.

#### **Desired Outcomes:**

- 1) Improved water optimization in meat packing and processing facilities
- 2) Improved water planning and stewardship in meat packing and processing facilities
- 3) Greater understanding of risk related to water quantity and quality for meat packing and processing facilities and companies
- 4) Implement locally relevant strategies to optimize water resource stewardship
- 5) Improved collaboration along the beef value chain related to water stewardship

#### DESCRIPTION OF INDICATOR AND METRICS

Water resource stewardship is crucial to the long-term viability of the Packer and Processor Sector, as well as the beef value chain. Industry-wide, water resource stewardship should be defined at the local level and used to inform corporate programs and best practices. That philosophy has been incorporated in this SAG approach; each facility has the flexibility to respond to unique local challenges and determine the most effective water resource stewardship approach for that location.

There are many operational challenges associated with reduced water use, most notably, the critical role water plays in a safe food supply. Water is used every day in facilities to ensure the highest food safety standards are met, and in some facilities, water reduction is made more difficult due to the need to

protect the safety of the food produced. Water quality also plays a critical role in food safety, and water entering facilities must meet stringent food safety requirements today. It is important that the Packer and Processor Sector continue to optimize water resources in each facility to reduce the overall water footprint of beef while consistently improving the quality of water leaving facilities, without negatively impacting food safety as related to water use.

Finally, location of a facility is a key consideration. Some facilities may be in water-stressed areas, so it is particularly important for these packers and processors to manage water responsibly. Additional consideration to unintended water resource impacts should also be considered including:

- 1) Electricity and other pre-chain water consumption (especially pre-chain impacts from materials such as corrugated cardboard), which has a significant contribution on consumptive water
- 2) End-of-life landfill disposal for production and packaging waste, which can result in decreased water quality
- 3) Other competitors for the usage water, such as cities, agriculture production, other companies, etc.

#### LEVEL 1 METRIC

#### METRIC 4.1.1 Is a water resource management plan implemented at the facility?

#### GUIDANCE TO ACHIEVE THE METRIC

Packing and processing facilities should have a water resource management plan that outlines optimal use and quality of the company's water resources. A water resource management plan should include information about current water use and outline processes for improved water efficiency. A water balance baseline can be established through an audit. This will allow the company to track the input and output of water used throughout the facility. It could also contain conservation activities and water reduction goals. A plan could also establish priorities to allocate funding and efforts for water efficiency projects.

A water resource management plan should follow the steps below:

- 1) Set an overarching policy or goal
- 2) Assess current water use and costs
- 3) Develop a water balance
- 4) Assess water efficiency opportunities and economics
- 5) Develop an implementation plan
- 6) Measure progress
- 7) Plan for contingencies

A water resource management plan should also include a wastewater management plan that is implemented in accordance with regulation and permitting requirements. Depending on the company's size, meat packing and processing facilities should utilize wastewater treatment to reach the appropriate water quality standards of discharged wastewater. The basic function of wastewater treatment is to speed up the natural processes by which water is purified. There are two basic stages in the treatment of wastes: primary and secondary. In the primary stage, solids are allowed to settle and are removed from wastewater. The secondary stage uses biological processes to further purify wastewater. Sometimes, these stages are combined into one operation. A third-party environmental consultant can help assess facility-specific needs.

Success Criteria: Continuous increase in the number of facilities that have a documented water resource management plan.

#### LEVEL 2 METRICS

#### METRICS 4.1.2

4.1.2a How many wastewater permit non-compliances has the facility had in the previous calendar year?

## 4.1.2b What is the water use in gallons/head/day (packers) or gallons/pounds of beef processed (processors)?

#### GUIDANCE TO ACHIEVE THE METRICS

Packing and processing facilities should track wastewater permit non-compliances, which is defined as receipt of a letter from the state, federal, or local environmental regulatory authority that specifically states a notice of violation. Stormwater violations are excluded. Packing and processing facilities should record water used per head (packers) and/or per pound of beef processed (processors).

Success Criteria: Reduction in the number of non-compliances; measure water use per production output; increase awareness of water use.

#### LEVEL 3 METRICS

#### METRICS 4.1.3

4.1.3a Does the company track discharge water quality over time?

4.1.3b Does the company have set goals for continued improvement?

4.1.3c Does the company make water performance efforts public?

**4.1.3d** Does the company participate in partnerships, initiatives, or programs to further advance water resource management?

#### GUIDANCE TO ACHIEVE THE METRICS

Industry leaders should be able to track and report on water quality and quantity, including short-term goals (within the reporting year) and long-term goals (across years). Leading companies should be engaged in industry organizations and/or initiatives to seek continuous improvement in this area. Packers and processors should publicly disclose their water quality and use performance. This information can be disclosed through a company website, annual report, sustainability or corporate responsibility report, or other publicly available documents. One example of an initiative could be to assess the water risk of direct operations using the <u>World Resource Institute (WRI) aqueduct tool</u><sup>208</sup> (or equivalent), and incorporate this data into local water management plans.

Success Criteria: Continuous improvement in companies and facilities tracking water quality and quantity, setting reduction targets, and optimizing water efficiency strategies; continuous improvement in engagement and collaboration along the value chain and transparency of water use and quality strategies utilized in companies/facilities that process beef.

#### TOOLS AND INFORMATIONAL RESOURCES

The following resources are not intended to be an exhaustive list. USRSB does not own or manage these resources, but they are provided as potential helpful tools for value chain participants.

<sup>&</sup>lt;sup>208</sup>https://www.wri.org/our-work/project/aqueduct

1) Meat Institute<sup>209</sup>

2) World Resource Institute (WRI) aqueduct tool<sup>210</sup>

### PACKER AND PROCESSOR SECTOR SUSTAINABILITY ASSESSMENT GUIDE: INDICATOR 4.2 LAND RESOURCES

METRIC 4.2 LAND RESOURCES	
Level 1	4.2.1 Does the company have initiatives and/or explore opportunities to mitigate land and biodiversity impacts from new facility developments?

**USRSB defines Land Resources as:** The stewardship of terrestrial and aquatic habitat in relation to water, soil, and biodiversity in an area; impacts of land use and land use conversion, both caused by and prevented by ranching and farming activities and other value-chain land use decisions.

**Suggested Frequency of Assessment:** To be conducted in association with new facility development and/or remodeling.

Responsible Party: Facility management.

#### **Desired Outcomes:**

- 1) Develop sustainable land management practices within facility guidelines for new facility development and/or remodeling.
- 2) Demonstrate land management considerations with plans.

#### **DESCRIPTION OF INDICATOR**

Sustainable Land Management (SLM) refers to practices and technologies that aim to integrate the management of land, water, biodiversity, and other environmental resources to meet human needs while ensuring the long-term sustainability of ecosystem services and livelihoods. Packers and processors are responsible for maintaining and protecting the land associated with their properties, which includes water and soil ecosystems. Land resources should be considered by each facility's management in regard to new facility development and remodeling.

#### LEVEL 1 METRIC

## METRIC 4.2.1 Does the company have initiatives and/or explore opportunities to mitigate land and biodiversity impacts from new facility developments?

#### GUIDANCE TO ACHIEVE THE METRIC

If new facility developments are expected to expand the footprint of the facility or alter existing land use, the company should anticipate how those impacts to land will be mitigated and seek to evaluate and minimize any anticipated operational impacts to, or effects on, biodiversity. Facilities management should

<sup>&</sup>lt;sup>209</sup>https://www.meatinstitute.org/index.php?ht=d/sp/i/240/pid/240

<sup>&</sup>lt;sup>210</sup>https://www.wri.org/our-work/project/aqueduct

develop sustainable land management guidelines for new facility development and remodeling. A plan should follow the steps below:

- 1) Set an overarching policy or goal
- 2) Assess current land use and costs
- 3) Understand local environmental regulations
- 4) Assess impact to biodiversity
- 5) Develop an implementation plan
- 6) Measure progress
- 7) Plan for contingencies

Success Criteria: Increase in companies adopting SLM guidelines for new facility development and/or remodeling.

### PACKER AND PROCESSOR SECTOR SUSTAINABILITY ASSESSMENT GUIDE: INDICATOR 4.3 AIR AND GREENHOUSE GAS EMISSIONS

METRICS 4.3 AIR AND GREENHOUSE GAS (GHG) EMISSIONS	
Level 1	4.3.1 Are strategies in place to optimize energy efficiency and reduce GHG emissions at company facility(ies)?
Level 2	4.3.2 What is the company's carbon dioxide equivalents (CO2 <i>e</i> ) per head or CO2 <i>e</i> per mass of finished product?
Level 3	4.3.3a Does the company make CO2 <i>e</i> publicly available?
	4.3.3b Does the company track GHG and air emissions over time and set goals for
	continued improvement?
	4.3.3c Does the company participate in partnerships, initiatives, or programs to
	further GHG emissions reduction and improve air quality?

**USRSB defines Air and GHG Emissions as:** The cumulative emissions of pollutants, including particulate matter, GHG, and other gaseous emissions from a sector for each process.

Suggested Frequency of Assessment: At least annually.

**Responsible Party:** Level 1 and 2 metrics are facility; Level 3 metric is required at a corporate and/or facility level.

#### **Desired Outcomes:**

- 1) Improve air quality, focusing on impacts on the local community, human health, and the environment
- 2) Greater understanding of emission sources and opportunities for emission reductions
- 3) Reduced impact on climate, and combat climate change
- 4) Better collaboration along the value chain on GHG emission reduction strategies

#### DESCRIPTION OF INDICATOR

Our food system in the U.S. is resilient, but climate change presents a risk that influences the industry's ability to create a more food-secure world. Not only does the beef industry face the challenge of a changing climate, it faces the challenge of producing more food for a growing, more affluent population. A

key driver for packers and processors in curtailing GHG emissions is the importance of energy to the safety of food, environmental compliance, production of our products, and the transportation of inputs and outputs. In the U.S., GHG emissions increased by 2.4% from 1990 to 2016. Since 2015, however, total U.S. GHG emissions have decreased by 1.9%. Carbon dioxide accounts for most of the nation's emissions and most of the increase since 1990. Transportation and electricity generation is the largest source of U.S. GHG emissions. Emissions per person have decreased slightly in the last few years (USEPA, 2018).



Figure 2: Greenhouse Gas Emission (USEPA, 2018)

Agriculture and climate change carry major implications for one another. Shifts in worldwide climate have the potential to impact global food production and jeopardize regional food security. Animal agriculture has consistently been working to reduce and mitigate GHG emissions and produce more food, fiber, and fuel products with fewer inputs. Many of the modern technology adoptions and management practices help to lower the resource consumption and GHG emissions from beef production.

#### LEVEL 1 METRIC

## METRIC 4.3.1 Are strategies in place to optimize energy efficiency and reduce GHG emissions at company facility(ies)?

#### GUIDANCE TO ACHIEVE THE METRIC

Improving energy efficiency is one of the easiest and most cost-effective ways to combat climate change and improve the competitiveness of a business. This can be achieved through tracking energy consumption, using new technologies to capture and reuse methane, using more energy-efficient equipment in processing plants, and optimizing transportation.

Furthermore, energy reduction opportunities have been noted by the NCBA's beef Life Cycle Assessment (LCA) in the following areas within the Packer and Processor Sector:

- 1) Increased use of biogas captured and converted by packing plants, leading to lower electricity requirements
- 2) Conversion of boilers at packing plants from diesel to natural
- 3) Reduced packaging requirements, using right-size packaging which reduces the pre-chain impacts of packaging production

Packers and processors can continue to reduce emissions within their sector and increase awareness of the risk that climate change imposes on agriculture, farmer livelihoods, and the ability to produce safe, wholesome food for years to come. This sector has a tremendous opportunity to focus on what can be directly controlled: environmental performance within plant walls. This may include commitments to reduce GHG intensity, improve energy efficiency, and increase the use of renewable energy as a way to reduce the impact of the plant on climate change.

Success Criteria: Continuous increase in the number of facilities with strategies in place to optimize energy efficiency and reduce GHG emissions.

#### LEVEL 2 METRIC

## METRIC 4.3.2 What is the company's carbon dioxide equivalents ( $CO_2e$ ) per head or $CO_2e$ per mass of finished product?

#### GUIDANCE TO ACHIEVE THE METRIC

 $CO_2e$  is the most popular method to calculate the GHG equivalence. Measuring  $CO_2e$  from business operations is the most comprehensive way to understand its contributions to GHG emissions and climate change. These emissions include direct emissions of GHGs from all sources under the company's control that include, but are not limited to, land-use change, equipment, production facilities, and transportation. A number of software tools are available to calculate  $CO_2e$ . The conversion factors should align with guidance from the U.S. Environmental Protection Agency (EPA) and/or the <u>GHG Protocol<sup>211</sup></u>.

Success Criteria: Increase in the number of companies measuring CO<sub>2</sub>*e* per head or CO<sub>2</sub>*e* per mass of finished product.

#### LEVEL 3 METRICS

#### METRICS 4.3.3

4.3.3a Does the company make CO<sub>2</sub>e publicly available?

4.3.3b Does the company track GHG and air emissions over time and set goals for continued improvement?

## 4.3.3c Does the company participate in partnerships, initiatives, or programs to further GHG emission reductions and improve air quality?

#### GUIDANCE TO ACHIEVE THE METRICS

Publicly reporting inventory CO<sub>2</sub>*e* resulting from business operations provides a transparent review of the emissions sources and the resulting impact. Inventory emissions can be made public, typically on an annual basis, and can be disclosed through a company website, annual report, sustainability or corporate responsibility report, SEC filings, or other publicly available documents. Packers and processors should have a documented process to track GHG and air emissions over time and disclose time-bound targets for continued improvement. Companies can make two types of targets, absolute or intensity, as described below:

**Absolute target:** A target that describes a reduction in actual emissions in a future year when compared to a base year. Examples:

<sup>&</sup>lt;sup>211</sup>https://ghgprotocol.org/sites/default/files/Stationary\_Combustion\_Guidance\_final\_1.pdf

- 1) Metric tonnes  $CO_2e$  or percentage reduction from base year
- 2) Metric tonnes CO<sub>2</sub>e or percentage reduction per year
- 3) Cap on emissions in metric tonnes  $CO_2e$

*Intensity target:* A target that describes a future reduction in emissions that have been normalized to a business metric when compared to normalized emissions in a base year. Examples:

- 1) Metric tonnes CO<sub>2</sub>e or percentage reduction per unit revenue relative to base year
  - Tracking GHG emissions over time results provides the company the benchmark data necessary to set feasible reduction goals
- 2) Metric tonnes CO<sub>2</sub>e or percentage reduction per unit of product relative to base year

Companies can have both absolute and intensity targets for GHG emission reductions. For long-term reduction plans (e.g., five years), the company should disclose progress against the target on an annual basis. Initiatives like the Carbon Disclosure Project (CDP), GHG Protocol, and others can help the company more effectively understand its GHG emissions sources and set commitments for continuous improvement. Other initiatives can also be adopted, such as programs to renew fleets, combine transportation along the value chain, renewable energy projects at plants, etc.

Success Criteria: More companies/facilities publicly reporting CO2*e*; more companies/facilities tracking GHG and air emissions; more companies setting targets to reduce GHG and air emissions and increased engagement and collaboration across the value chain.

### PACKER AND PROCESSOR SECTOR SUSTAINABILITY ASSESSMENT GUIDE: INDICATOR 4.4 EFFICIENCY AND YIELD

METRICS 4.4 EFFICIENCY AND YIELD		
Level 1	4.4.1 Is a program to divert waste from landfills implemented at the facility?	
Level 2	4.4.2 How much mass of waste/head or waste/mass of finished product does the company	
	divert from landfill?	
Level 3	4.4.3a Does the company track waste reduction over time and set goals for continued	
	improvement?	
	4.4.3b Does the company participate in partnerships, initiatives, or programs to further	
	advance waste reduction strategies?	

**USRSB defines Efficiency and Yield as:** 1) Efficiency is expressed as the unit of input required to produce a unit of output, and 2) Yield is the total product generated per unit of time or space; both concepts address waste as a negative characteristic and drive toward improved profitability.

Suggested Frequency of Assessment: At least annually.

**Responsible Party:** Level 1, 2 and the first of Level 3 metrics are facility level; the second metric under Level 3 can be at the corporate and/or facility level.

#### **Desired Outcomes:**

- 1) The amount of waste generated by the Packer and Processor Sector is reduced
- 2) Waste management choices of the individual facility protect the environment
- 3) The consumption of material resources and the waste generation that accompanies meat processing do not result in contamination of air, land, and/or water

- 4) Waste is reduced by using diversion and reuse whenever possible
- 5) When waste must be sent to landfill, it is done so responsibly

#### DESCRIPTION OF INDICATOR AND METRICS

The Efficiency and Yield Indicator for the Packer and Processor Sector of the U.S. beef value chain focuses on materials, with the metrics addressing total amount of waste to landfill and amount of waste sent to a landfill per pound of beef produced. Profitability was not selected as an indicator for this SAG. The USRSB believes that profitability is foundational to all indicators. Additionally, the USRSB is a multi-stakeholder group that includes direct competitors. As such, there are legal and ethical concerns regarding discussions around pricing and profit, and therefore, they cannot be included.

Efficiency in electricity and other fuel usage is addressed under the Air and GHG Emissions indicator. Packer and processors seeking to improve their sustainability should consider the three Rs of waste management: Reduce, Reuse, and Recycle (Figure 2).



Figure 2: Waste management hierarchy (USEPA, 2018b)

For obvious reasons, reducing the amount of waste sent to landfill is good for the planet, as generating less waste means less money spent on energy, ingredients, packaging, and waste removal services. Composting waste and recycling processing and packaging materials can save money. Compared to other manufacturers, food and beverage processors face a unique problem: excess product usually has a relatively short shelf life. For this reason, the EPA developed an inverted pyramid (see Figure 2) showing the preferred disposal methods of surplus product and waste. The last step any packer or processor should take to manage surplus product or waste is sending it to a landfill, given that practical alternatives are available. Options include feeding people the surplus food, using it for animal feed, recycling and reusing it for industrial purposes, and composting it to create nutrient-rich soil. Packers and processors could influence waste to landfill by implementing strategies and programs such as:

- 1) Efficient wastewater treatment
- 2) Product and market innovation to reduce animal byproduct wastes
- 3) Comprehensive waste management program
- 4) Increased recycling and reuse
- 5) Zero waste to landfill policy
- 6) Paperless office

- 7) Right-size packaging
- 8) Composting food waste

#### LEVEL 1 METRIC

#### METRIC 4.4.1 Is a program to divert waste from landfills implemented at the facility?

#### GUIDANCE TO ACHIEVE THE METRIC

Packers and processors should establish programs to divert waste from landfills, factoring in the personnel and the financial resources to track waste generation, maintain systems, and implement cost-effective waste reduction projects. Elements of a successful program may include:

- 1) Identifying and quantifying materials entering the facility and waste streams by category (e.g., packaging, pallets, food)
- 2) Pursuing a prioritized approach to diversion through (a) source reduction, (b) reuse, (c) composting, (d) recycling, (e) incineration with energy recovery, and (f) incineration
- 3) Engaging stakeholders (i.e., employees, suppliers, customers, waste vendors) to support the program
- 4) Capturing data on waste volume and diversion rates to track progress and set goals

The long-term goal should be to pursue as a zero-waste-to-landfill objective, as much as possible. Properly managing waste resources may also provide economic benefits for a company.

Success Criteria: Continuous increase in the number of facilities that have a documented waste management plan.

#### LEVEL 2 METRIC

## METRIC 4.4.2 How much mass of waste/head or mass of waste/mass of finished product does the company divert from landfill?

#### **GUIDANCE TO ACHIEVE THE METRIC**

Waste is defined as product that must be disposed of by the plant/operation that would end up in a landfill if not otherwise diverted, reused, recycled, etc. Packers and processors should measure the amount of waste diverted from landfills. Waste diverted from landfills may be defined as total mass (lbs.) per unit of measurement (e.g., lbs. per head or lbs. per finished product), or a percentage of total waste (e.g., 90% waste from landfill) for a specified time period (quarterly to annually).

Success Criteria: Continuous decrease in waste to landfill.

#### LEVEL 3 METRICS

#### METRICS 4.4.3

4.4.3a Does the company track waste reduction over time and set goals for continued improvement? 4.4.3b Does the company participate in partnerships, initiatives, or programs to further advance waste reduction strategies?

#### GUIDANCE TO ACHIEVE THE METRICS

Leading companies should include a waste-diverted-from-landfill component as part of an overall sustainability strategy. Both short- and long-term goals should be set, and company performance measured by defined key metrics to demonstrate continuous improvement. A company may also review

upstream waste reduction opportunities. Leadership activities could include the use of extended shelf-life packaging (e.g., vacuum packaging) which contributes to reduced food waste downstream or the sourcing of packaging that is designed to be recyclable. Leading companies should seek opportunities for continuous education in relation to waste resources management through industry organizations, mentoring programs, partnerships, or other initiatives. Leading companies should seek solutions to challenging waste issues. Sharing best practices with other companies is encouraged.

Success Criteria: Increase in companies setting goals for waste reduction and an increase in partnerships across the sector/value chain to reduce waste.

#### TOOLS AND INFORMATIONAL RESOURCES

The following resources are not intended to be an exhaustive list. USRSB does not own or manage these resources, but they are provided as potential helpful tools for value chain participants.

- 1) EPA Food Recovery Challenge<sup>212</sup>
- 2) EPA: Land, Waste, and Cleanup Topics<sup>213</sup>
- 3) ISO 14001 Environmental Management System<sup>214</sup>
- 4) Links to Hazardous Waste Programs and U.S. State Environmental Agencies<sup>215</sup>
- 5) <u>RecyclingWorks in Massachusetts<sup>216</sup></u>
- 6) <u>Sustainable Packaging Coalition<sup>217</sup></u>
- 7) The Zero Waste Business Council<sup>218</sup>

### PACKER AND PROCESSOR SECTOR SUSTAINABILITY ASSESSMENT GUIDE: INDICATOR 4.5 ANIMAL HEALTH AND WELL-BEING

METRICS 4	4.5. ANIMAL HEALTH AND WELL-BEING
Level 1	<ul> <li>4.5.1a Packer: Does the company have a comprehensive animal welfare program, including third-party verification?</li> <li>4.5.1b Processor: Does the company have a documented animal welfare policy (or equivalent) and encourage the adoption of the Framework's Animal Health and Wellbeing Metrics?</li> </ul>
Level 2	4.5.2a Packer: What is the company's total number of U.S. Department of Agriculture (USDA) non-compliance animal welfare violations per 100,000 head processed in the previous calendar year?

<sup>&</sup>lt;sup>212</sup>http://www.epa.gov/sustainable-management-food/food-recovery-challenge-frc

<sup>&</sup>lt;sup>213</sup>http://www.epa.gov/environmental-topics/land-waste-and-cleanup-topics

<sup>&</sup>lt;sup>214</sup>http://www.iso.org/iso/home/standards/management-standards/iso14000.htm

<sup>&</sup>lt;sup>215</sup>https://www.epa.gov/hwgenerators/links-hazardous-waste-programs-and-us-state-environmental-agencies

<sup>&</sup>lt;sup>216</sup>http://www.recyclingworksma.com/

<sup>&</sup>lt;sup>217</sup>http://www.sustainablepackaging.org/

<sup>&</sup>lt;sup>218</sup>http://www.uszwbc.org/

	4.5.2b Packer: What percentage of cattle come under a third-party audit? What percentage pass on first audit?
	4.5.2c Processor: Does the company use second- or third-party animal welfare audits such as the North American Meat Institute's (NAMI) Animal Handling Guidelines and Audit Guide to verify policy compliance to at least the packer level?
Level 3	4.5.3a Does the company track animal welfare over time and set goals for continued improvement?
	4.5.3b Does the company participate in partnerships, initiatives, or programs and/or engage its suppliers to advance continuous improvement regarding animal health and well-being in the beef value chain?

**USRSB defines Animal Health and Well-being as:** The cumulative effects of cattle heath, nutrition, care and comfort.

Suggested Frequency of Assessment: At least annually.

**Responsible Party:** Level 1 and 2 metrics are facility; Level 3 metrics are required at a corporate and/or facility level.

#### **Desired Outcomes:**

- 1) Ensure employee safety while handling cattle
- 2) Ensure and continuously work toward improving cattle welfare, with respect for their natural behavior
- 3) Ensure the safety and quality of beef products
- 4) Avoid product loss due to depletion of quality and/or injuries in carcasses, or plant downtime
- 5) Improved reputation of animal welfare in the packing plant

#### **DESCRIPTION OF INDICATOR**

While beef sustainability is often equated with environmental impact, it also encompasses economic viability and societal acceptance. The dramatic increase in global population has resulted in the intensification (increased output per unit of input) of agriculture to meet growing food demand. Intensification in the beef industry has received scrutiny because some believe increased productivity comes at the expense of animal health and welfare. Ensuring that cattle have the highest standards of health and well-being is beneficial to both individual beef producers and the environmental, social, and economic sustainability of the entire beef industry.

Just like people experience stress, cattle can experience stressful events throughout their life cycle. If stressful events cause cattle to have decreased growth rates, feed conversion efficiency, and/or reproductive rates, or lead to an increased susceptibility to illness, then all three components of beef sustainability (environmental, social, and economic) can be negatively impacted.

Transportation can be a stressful situation for cattle due to handling, noise, stocking density, journey duration, and various other factors. The stress of transportation can result in decreased immune function, decreased feed intake, and increased illness and mortality. Some stressors that cattle experience, such as weather extremes, are unavoidable. Thermal stressors affect cattle health, productivity, growth, and reproductive performance long after the weather event occurs. Mitigating the effects of weather extremes is not always feasible, particularly because cattle spend most of their lives outdoors. Some management interventions, however, can improve both animal comfort and productivity, while positively impacting the environment. Providing shade or sprinklers in the summertime and shelters or wind breaks in the wintertime can reduce thermal stresses. Reducing thermal stressors improves feed-to-gain ratios,

reproductive success, and final carcass weight, thereby simultaneously improving animal well-being and lowering environmental impacts per unit of beef. Management techniques and genetic selection can be used to reduce cattle stress, resulting in simultaneous improvements of animal health and welfare.

Research demonstrates that stressful handling during loading and unloading of animals can decrease carcass quality and yield. Additionally, improper handling of cattle can result in team member health and safety concerns. Finally, ensuring that cattle health and welfare are prioritized on site is crucial in avoiding injuries to cattle. Meat packing companies should follow humane methods of slaughter, which are enforced by the USDA Food Safety and Inspection Service (FSIS). These methods were passed in the Humane Slaughter Act of 1978. This act requires the proper treatment and humane handling of all food animals slaughtered in USDA-inspected slaughter plants. The USDA FSIS also provides surveillance testing to protect and prevent violative antibiotic residues or residues within the government-prescribed tolerance levels. If beef is found with violative antibiotic residues, it is removed from the food chain and discarded. For additional discussion on this topic, please see the <u>Cow-Calf</u> Sector and <u>Feedyard</u> Sector Animal Health and Well-being Indicators.

#### LEVEL 1 METRICS

#### **METRIC 4.5.1**

## 4.5.1a *Packer:* Does the company have a comprehensive animal welfare program, including third-party verification?

4.5.1b *Processor:* Does the company have a documented animal welfare policy (or equivalent) and encourage the adoption of the Framework's Animal Health and Well-being Metrics?

#### GUIDANCE TO ACHIEVE THE METRICS

Packers and processors should demonstrate zero tolerance for animal mistreatment.

**Packer:** Packers should have an established animal welfare program that governs the expectations of cattle handling, care, and welfare at their facilities. This program should include expectations of cattle transporters, producers, and others not officially employed by the establishment. Both internal and third-party audits should be conducted to verify adherence to the standards outlined in the most current version of the NAMI Recommended Animal Handling Guidelines and Audit Guide.

**Processor:** Processors should have a written policy describing the company's animal welfare requirements for its beef raw materials' suppliers. This policy should at a minimum require beef raw material suppliers to meet regulatory requirements for animal welfare, but it should also require adherence the most current version of the NAMI Recommended Animal Handling Guidelines and Audit Guide.

At packer and processor facilities, the NAMI guidelines should be applied. In addition, packer/processing companies should communicate to the producer end of the supply chain that the company encourages adoption of the Framework's <u>Cow-Calf</u>, <u>Auction Market</u> and <u>Feedyard</u> Sectors' Animal Health & Well-being Metrics (which advocate for BQA principle adoption) and are publicly available.

Success Criteria: Increased adoption by packers and processors of detailed animal welfare policies and programs that meet or exceed industry standards.

#### LEVEL 2 METRICS

#### **METRIC 4.5.2**

#### Packer:

4.5.2a What is the company's total number of all USDA non-compliance animal welfare violations per 100,000 head processed in the previous calendar year?

## 4.5.2b What percentage of cattle come under a third-party audit? What percentage pass on first audit? *Processor:*

4.5.2c Does the company use second- or third-party animal welfare audits, such as the NAMI Recommended Animal Handling Guidelines and Audit Guide, to verify compliance with its policy, at least to the packer level?

#### GUIDANCE TO ACHIEVE THE METRICS

**Packers:** Packers should track total number of all USDA non-compliance animal welfare violations per 100,000 head processed to ensure transparency throughout the company and reduce these violations. USDA non-compliance is defined as a report that is issued to an establishment by USDA-FSIS inspection program personnel who has determined that an establishment has failed to meet one or more regulatory requirements. The event is documented in writing on a non-compliance report (NR) explaining the observation and the nature of the regulatory action incurred. Packers should also track the percentage of cattle slaughtered under a third-party animal welfare audit, as well as the number of audits passed on the first attempt. The goal should be that 100% of cattle are slaughtered in accordance with a third-party animal welfare audit and that 100% of audits pass on the first attempt. Packers should ensure that all animal handlers and internal auditors are trained against the recognized industry standards. Employee training records should be kept and updated annually. The training content should be available with that record, as a best practice.

**Processors:** Processors should verify and track second- and third-party animal welfare audits or certifications at a minimum of an annual basis for each of its suppliers of beef raw materials and be able to produce documents demonstrating completion with satisfactory results. This information should be available from the source plant of the beef raw materials, regardless of who sold the meat (packer, broker, or other). This information should include the date and source of the audit, auditor's name, and the audit results (pass/fail). Although second-party audits are acceptable, third-party audits are preferable at least at some frequency. Processors who engage in animal welfare audits at the packer level (as a customer) should ensure that auditors are properly trained on the NAMI Recommended Animal Handling Guidelines. Certification from a recognized certification body such as the Professional Animal Auditor Certification Organization (PAACO) is recommended.

Success Criteria: Decrease in the number of USDA non-compliance animal welfare violations; 100% of cattle in the U.S. processed in accordance with third-party animal welfare audit standards, with an increase in the number of audits that pass on the first attempt (the goal being 100%).

#### LEVEL 3 METRICS

#### **METRIC 4.5.3**

4.5.3a Does the company track animal health and well-being over time and set goals for continued improvement?

4.5.3b Does the company engage its suppliers or participate in partnerships, initiatives, or programs to advance continuous improvement regarding animal health and well-being in the beef value chain?

#### **GUIDANCE TO ACHIEVE THE METRICS**

To promote accountability and transparency and to ensure that the humane treatment of animals (throughout all life stages) remains a priority, the company should provide a public statement regarding animal health and welfare expectations in the value chain. The company may choose to make audit performance information accessible to the public via the company website, for example, to demonstrate compliance and commitment.

Animal health and welfare measurements that are meaningful to the company should be tracked over time, and internal improvement goals should be defined. Beyond the annual audits and audit requirements, leading companies should continue to advance in the area of animal health and well-being. Industry leaders should be able to demonstrate a documented animal health and well-being policy that includes short-term goals and long-term goals. Leading companies should be engaged in industry organizations to seek continuous improvement in this area.

Success Criteria: Increase in the number of companies tracking progress on animal welfare and setting long-term goals; increased sharing within the Packer and Processor Sector of best practices in animal handling and slaughter.

#### TOOLS AND INFORMATIONAL RESOURCES

The following resources are not intended to be an exhaustive list. USRSB does not own or manage these resources, but they are provided as potential helpful tools for value chain participants.

- 1) <u>Animalhandling.org</u>
- 2) <u>Beef facts How does animal health and welfare impact sustainability?<sup>219</sup></u>
- 3) <u>BQA Beef Quality Assurance<sup>220</sup></u>
- 4) Dr. Temple Grandin<sup>221</sup>
- 5) Global Report Initiative (GRI) Sector Guidance
  - Food Processing Sector<sup>222</sup>
  - Food Processing Sector Supplement<sup>223</sup>
- 6) <u>NAMI North American Meat Institute<sup>224</sup></u>
- 7) <u>National Dairy Farm Stockmanship Training<sup>225</sup></u>
- 8) <u>PACCO Professional Animal Auditor Certification Organization<sup>226</sup></u>
- 9) USDA Humane Methods of Slaughter Act<sup>227</sup>

## PACKER AND PROCESSOR SECTOR SUSTAINABILITY ASSESSMENT GUIDE: INDICATOR 4.6 EMPLOYEE SAFETY AND WELL-BEING

<sup>219</sup>http://www.beefresearch.org/CMDocs/BeefResearch/Sustainability\_FactSheet\_TopicBriefs/FS-

11\_Animal\_Welfare\_Impact\_on\_Sustainability.pdf

<sup>220</sup>http://www.bqa.org/Media/BQA/Docs/cchg2015\_final.pdf

<sup>&</sup>lt;sup>221</sup>http://www.grandin.com/

<sup>&</sup>lt;sup>222</sup>https://www.globalreporting.org/resourcelibrary/GRI-G4-Food-Processing-Sector-Disclosures.pdf

<sup>&</sup>lt;sup>223</sup>https://www.globalreporting.org/resourcelibrary/G3-English-Food-Processing-Sector-Supplement.pdf

<sup>&</sup>lt;sup>224</sup>https://www.meatinstitute.org/index.php?ht=d/sp/i/101361/pid/101361

<sup>&</sup>lt;sup>225</sup>http://www.nationaldairyfarm.com/dairy-stockmanship-training

<sup>&</sup>lt;sup>226</sup>https://www.animalauditor.org/

<sup>&</sup>lt;sup>227</sup>https://www.nal.usda.gov/awic/humane-methods-slaughter-act

METRICS 4.6. EMPLOYEE SAFETY AND WELL-BEING	
Level 1	4.6.1 Does the company have a documented employee safety and well-being program
	that engages front-line employees and leadership?
Level 2	4.6.2 Does the company track Total Recordable Incident Rates (TRIR)?
Level 3	4.6.3a Does the company track trends on TRIR and reference rates against the North
	American Industry Classification System (NAICS) industry standard rate to set goals for
	the upcoming year?
	4.6.3b Does the company participate in partnerships, initiatives, or programs to
	further advance employee safety and well-being?

**USRSB defines Employee Safety and Well-being as:** The implementation of safety programs and training to provide a safe workplace and help to prevent workplace accidents and injuries associated with production, processing, and distribution of beef and the relative prosperity of workers employed in those activities.

#### Suggested Frequency of Assessment: At least annually.

**Responsible Party:** Level 1 and 2 metrics are facility; Level 3 metrics are required at a corporate and/or facility level.

#### **Desired Outcomes:**

- 1) Reduced employee injuries in meat packing and processing facilities
- 2) Improved safety planning and culture in meat packers' and processors' operations
- 3) Greater understanding of issues surrounding employee safety and the associated risks for meat packers and processors
- 4) Better collaboration in beef value chain on employee safety issues

#### **DESCRIPTION OF INDICATOR**

Employee safety and well-being is a critical component to a sustainable packer or processor operation. Providing a safe workplace has rewards for both the employee and the employer and can be seen in improved morale, increased productivity, reduced costs, and less absenteeism. The Occupational Safety and Health Act (OSHA) was established in 1970 and was the first comprehensive safety and health regulation covering U.S. workplaces. Employers are held responsible for meeting those standards, which include training, implementing effective safety programs, maintaining equipment, and reducing workplace hazards. Though OSHA sets the minimum standards for employee safety, each employer should continuously assess potential hazards in an effort to address these before they cause an injury or illness.

Due to the nature of the work in the Packer and Processor Sector, certain aspects of employee safety are very critical to ensuring a safe workplace. Sharp tools, moving equipment, and repetitive motion represent hazards that are not found in all workplaces. It is critical to employee safety that safe work practices are implemented, either through engineering controls or personal protective equipment to address these hazards and that this equipment is maintained in good operational condition at all times.

It is important that the packers and processors continue to optimize employee safety and well-being. While the industry has worked diligently to provide safe working conditions and reduce injury rates, there is always opportunity for improvement.
### LEVEL 1 METRIC

## METRIC 4.6.1 Does the company have a documented employee safety and well-being program that engages front-line employees and leadership?

### GUIDANCE TO ACHIEVE THE METRIC

A safety and well-being program should include safety policies, governance structure, and management programs that are designed to promote a safe work culture and meet a minimum of Equal Employment Opportunity Compliance (EEOC) and OSHA regulations. Programs should be clearly communicated (with documentation) to all employees to ensure employees are treated fairly by the employer in accordance with all U.S. regulations. Policy should focus on training and educating team members and eliminating work hazards. The safety management program should meet OSHA standards and cover all team members.

A safety and health management system outlines the critical components of a safety culture and provides a foundation for injury reduction. Because each workplace is different, developing a safety and health management system should address the company or facility's specific needs and requirements. There are four basic elements to all good safety and health programs, as follows:

- 1) **Management commitment and employee involvement**: The manager or management team leads the way by establishing policy, assigning and supporting responsibility, setting an example, and involving employees.
- 2) Worksite analysis: The worksite is continually analyzed to identify all existing and potential hazards.
- 3) Hazard prevention and control: Methods to prevent or control existing or potential hazards are put in place and maintained.
- 4) **Training for employees, supervisors, and managers**: Managers, supervisors, and employees are trained to understand and deal with worksite hazards.

Success Criteria: Continuous increase in the number of facilities implementing/utilizing formal safety programs.

### LEVEL 2 METRIC

### METRIC 4.6.2 Does the company track Total Recordable Incident Rates (TRIR)?

### GUIDANCE TO ACHIEVE THE METRIC

The company should record TRIR in accordance with OSHA regulations and guidelines.

### **Determining Total Recordable Incident Rates (TRIR)**

- 1) Take the total number of recordable injuries for the year from the OSHA 300 log
- 2) Multiply that number by 200,000 (200,000 represents the number of hours worked by 100 full-time employees, 40 hours per week for 50 weeks per year)
- 3) Divide that number by the actual hours worked by all employees for the year

### Example:

The following discussion illustrates how ABC Company—a fictitious packer processor with 200 employees—might conduct a statistical safety and health evaluation.

The ABC Company has seven injuries and illnesses logged and 400,000 hours worked by all employees during 2016. Using the formula, the TRIR would be calculated as follows: (7 x 200,000) / 400,000 = 3.5

Success Criteria: Reduction in TRIR for participating companies.

#### LEVEL 3 METRICS

#### METRICS 4.6.3

4.6.3a Does the company track trends on TRIR and reference rates against the North American Industry Classification System (NAICS) industry standard rate to set goals for the upcoming year? 4.6.3b Does the company participate in partnerships, initiatives, or programs to further advance employee safety and well-being?

### GUIDANCE TO ACHIEVE THE METRICS

To develop and document annual goals, and track company trends on TRIR, clear documentation of performance (incidences) from at least the last three years is needed along with a benchmark against the NAICS industry benchmark rates. The goals should be communicated to all levels of the organization through some verifiable means. Industry leadership is evidenced by the company's involvement in activities above and beyond regulatory requirements, along with demonstration of the company being proactive in this area. Participation in industry organizations, recognition by third parties, and programs that distinguish the company based on its employee safety and well-being efforts are all indicators.

Success Criteria: More companies/facilities tracking incident rates, using historical injury data to evaluate safety program optimization strategies, and setting goals to continue to improve safety results; increase in sharing of best practices regarding injury reduction programs.

### TOOLS AND INFORMATIONAL RESOURCES

The following resources are not intended to be an exhaustive list. USRSB does not own or manage these resources, but they are provided as potential helpful tools for value chain participants.

### 1) American Society of Safety Engineers<sup>228</sup> (ASSE)

- Local chapters of ASSE are available in every state and can provide access to resources and professionals working in the safety industry
- 2) Meat industry experts are available to assist with development of programs and with OSHA- and EPArelated issues
- 3) National Safety Council<sup>229</sup>
  - Local chapters of the National Safety Conference are available in every state and can provide access to resources and professionals working in the safety industry

### REFERENCES

Capper, J. L. (2011). The Environmental Impact of Beef Production in the United States: 1977 compared with 2007. *Journal of Animal Science*, 89(12), (pp4249-4261).

Cattle Buyers Weekly. 2017. In-house estimates. Available from http://www.cattlebuyersweekly.com

<sup>&</sup>lt;sup>228</sup>http://www.asse.org/

<sup>229</sup> http://www.nsc.org/

EPA. 2017. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2015. *EPA Greenhouse Gas* (2017). Retrieved from

https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2015

- LMIC. 2018a. Monthly Cattle Slaughter by Class, Weights, etc. *Livestock Marketing Information Center*. (2018). Available from <u>http://www.lmic.info</u>.
- LMIC. 2018b. Quarterly Commercial Cattle Slaughter, Beef Production, Per Capita Disappearance, and Prices. *Livestock Marketing Information Center*. (2018). Available from <a href="http://www.lmic.info">http://www.lmic.info</a>.
- Thoma, G., Putman, B., Matlock, M. (2017). Sustainability Assessment of U.S. Beef Production. *Beef Sustainability*. Retrieved from <u>https://www.beefresearch.org/CMDocs/BeefResearch/Sustainability%20Completed%20Project%2</u> <u>OSummaries/Sustainability\_Assessment\_Executive\_Summary.pdf</u>
- USDA. 2017a. Global Agricultural Trade Service. *United States Department of Agriculture, Foreign Agricultural Service.* (2017). Retrieved from https://apps.fas.usda.gov/Gats/default.aspx.
- USDA. 2017b. Monthly Trade Report. *United States Department of Agriculture, Economic Research Service.* (2017). Retrieved from <a href="https://apps.fas.usda.gov/Gats/default.aspx">https://apps.fas.usda.gov/Gats/default.aspx</a>.
- USDA. 2018. Livestock Slaughter Summary 2018. United States Department of Agriculture, National Agricultural Statistics Service. (2018). Retrieved from https://apps.fas.usda.gov/Gats/default.aspx.
- USEPA. 2018a. Fast Facts 1990 2016 National-Level Greenhouse Gas Inventory. United States Environmental Protection Agency. (2018). Retrieved from <u>https://www.epa.gov/sites/production/files/2018-</u> 04/documents/9509\_fastfacts\_20180410v2\_508.pdf
- USEPA. 2018b. Sustainable Materials Management: Non-Hazardous Materials and Waste Management Hierarchy. United States Environmental Protection Agency. (2018). Retrieved from <u>https://www.epa.gov/smm/sustainable-materials-management-non-hazardous-materials-and-</u> waste-management-hierarchy

# U.S. BEEF INDUSTRY SUSTAINABILITY FRAMEWORK: 5. RETAIL AND FOOD SERVICE SECTOR

OVERVIEW OF RETAIL AND FOOD SERVICE SECTOR	112
RETAIL AND FOOD SERVICE SECTOR SUSTAINABILITY ASSESSMENT GUIDES (SAG) What to Expect	<b>112</b> 113
Retail and Food Service Metric Development	113
Diverse Business Models	114
SAG FOR INDICATOR 5.1 WATER RESOURCES	115
Description of Indicator and Metrics	115
Level 1 Metric	
Guidance to Achieve the Metric	
Level 2 Metrics	
Guidance to Achieve the Metrics	
Level 3 Metrics	117
Guidance to Achieve the Metrics	
Tools and Informational Resources	
Case Studies	120
SAG FOR INDICATOR 5.2 LAND RESOURCES	
Description of Indicator and Metrics	122
Level 1 Metric	122
Guidance to Achieve the Metric	123
Level 2 Metrics	123
Guidance to Achieve the Metrics	124
Tools and Informational Resources	125
SAG FOR INDICATOR 5.3 AIR AND GREENHOUSE GAS EMISSIONS	125
Description of Indicator and Metrics	126
Level 1 Metric	
Guidance to Achieve the Metrics	127
Level 2 Metrics	
Guidance to Achieve the Metrics	128
Level 3 Metrics	129
Guidance to Achieve the Metrics	129
Tools and Informational Resources	129
SAG FOR INDICATOR 5.4 EFFICIENCY AND YIELD	132
Description of Indicator and Metrics	133
Level 1 Metrics	134
Guidance to Achieve the Metrics	134
Level 2 Metrics	

Guidance to Achieve the Metrics	
level 3 Metrics	135
Guidance to Achieve the Metrics	135
Tools and Informational Resources	135
Case Studies	137
SAG FOR INDICATOR 5.5 ANIMAL HEALTH AND WELL-BEING	
Description of Indicator and Metrics	139
Level 1 Metrics	139
Guidance to Achieve the Metrics	140
Level 2 Metrics	140
Guidance to Achieve the Metrics	140
Level 3 Metrics	141
Guidance to Achieve the Metrics	141
Tools and Informational Resources	141
Case studies	143
SAG FOR INDICATOR 5.6 EMPLOYEE SAFETY AND WELL-BEING	143
Description of Indicator and Metrics	144
Level 1 Metrics	144
Guidance to Achieve the Metrics	145
Level 2 Metric	
Guidance to Achieve the Metric	145
Level 3 Metrics	
Guidance to Achieve the Metric	
Tools and Informational Resources	
Case Studies	147
REFERENCES	147

### OVERVIEW OF THE RETAIL AND FOOD SERVICE SECTOR

The Retail and Food Service Sector represents food retailers, including grocery stores, mass merchandisers, hotels, restaurants, convenience stores, food service facilities, and food delivery companies. This sector is an important member of the U.S. Roundtable for Sustainable Beef (USRSB) and the beef value chain, as it distributes, sells, and serves beef directly to consumers. Participation in the U.S. Beef Industry Sustainability Framework is an opportunity for retail and food service organizations to contribute to domestic sustainability initiatives, with a special focus on the beef industry. The collective contribution of the sector and engagement with its value chains – which are often shared – will result in improved outcomes for each sustainability indicator. By tracking their own progress using the Framework's metrics, participants can demonstrate their commitment to working with the full beef value chain to advance the sustainability of the beef industry.

### OVERVIEW OF THE RETAIL AND FOOD SERVICE SECTOR

The Framework's metrics for the Retail and Food Service Sector have been designed to support retailers and food service providers regardless of where they are on their sustainability journey. For companies just beginning to engage on these issues, the metrics and assessment guides provide a clear starting point. Companies that are looking to take their sustainability efforts to the next level will find resources for continuous improvement. Finally, companies with established sustainability programs may use the metrics to evaluate and validate their approaches and find opportunities to benchmark with peer companies who have shared goals and challenges.

### WHAT TO EXPECT

The information presented in the Retail and Food Service Sector Sustainability Assessment Guides (SAGs) will assist in the adoption and implementation of the six high-priority indicators with supporting documents, guidance, resources, and best-practices identified by USRSB members and supporting industries. The content and resources listed in the guidance accompanying many of the metrics are intended to be used only as suggestions; they should not be interpreted as standards.

Each indicator has a **Tools and Resources section**. In this section, relevant resources, case studies, and tools have been provided to assist retail and food service operations in their sustainability efforts. These lists are not exhaustive but provide a good starting point.

### RETAIL AND FOOD SERVICE METRIC DEVELOPMENT

The Retail and Food Service Sector metrics outline the sector's approach to continuous improvement across three levels in order to encourage participants in the sector to:

- 1) Understand the impacts of their business on each indicator
- 2) Develop and implement plans for continuous improvement in their own operations
- 3) Engage and collaborate with their suppliers
- 4) Measure and report progress

Recognizing that beef is one of many products sold or served throughout the Retail and Food Service Sector, the metrics are specific to beef when possible.

The following SAGs describe and define the metrics for each of the six high-priority sustainability indicators. The SAGs also include resources and tools which will assist individual operators in assessing their own operations and identifying and implementing opportunities for improvement as it relates to the sustainability indicators. Importantly, adoption and use of the methods and tools described in the SAGs is voluntary. The SAGs are primarily intended to assist operators in improving a wide range of outcomes on their operations over time.

For each of the six high-priority indicators, the SAG will include:

- 1) A description of the indicator to ensure a clear understanding of its intent
- 2) A description of the metric selected to measure the indicator
- 3) Supporting guidelines that elaborate on the context of the metric, including guidelines to address various elements of the metric
  - It is important to note:
    - i) Individual operators may or may not be addressing all the items asked in the supporting guidelines for a particular metric

- ii) Knowing what some of these additional elements are creates the opportunity for that operator to consider addressing those items going forward
- iii) Action on the part of the operator to address the listed items, or other items, over time is a means of demonstrating continuous improvement
- 4) Resources for implementation (not meant to be an exhaustive list), including:
  - Recommended practices for improving a particular metric
  - Summary of existing information for that metric
  - Tools (software, apps, hardware, etc.), for supporting metric assessment
  - Case studies
  - Technical support information
- 5) Suggested methods to monitor change and/or progress over time

A key tenet of sustainability is managing any operational task to strive toward **continuous improvement**. As this self-assessment is worked through on an operation, the guidelines below should be considered, and implementation planned in accordance with individual operation environments, situations, and needs. Methods to monitor change and/or progress over time also need to be identified. Incorporating guidelines, such as those identified in this SAG, into routine process reviews will potentially improve both the efficiency and sustainability of the operation.

The approach of continuous improvement was established to highlight the important role of the Retail and Food Service Sector as the interface between consumers and the beef industry and to support the close collaboration the sector has with the full beef value chain.

The principles guiding the three-tiered approach, within each indicator, are as follows:

- 1) Level 1 Metrics Operational Awareness: seeks awareness and engagement within the organization's own operation, focusing on baseline assessments and benchmarking
- 2) Level 2 Metrics Programs to Address Metrics in Own Operations and Supplier Collaboration: seeks to both implement programs targeted to the metrics within the organization's own operation and engage direct suppliers
- 3) Level 3 Metrics Measurement & Reporting: seeks to measure, report and set targets for continuous improvement within the organization's own operations and collaborate with direct suppliers

### **DIVERSE BUSINESS MODELS**

The breadth of operations and ownership models within the Retail and Food Service Sector means there are not "one size fits all" solutions or tools. A similar theme across all sectors involved in the beef industry, each business in the Retail and Food Service Sector is a unique operation, and implementation of the Framework's metrics should be tailored accordingly.

### FRANCHISED BUSINESS EXAMPLE

For example, for the Retail and Food Service Sector members with a franchise business model, the sector recommends organizations start by implementing the Framework's metrics in company-owned operations – *at a minimum* – and include a vision for broader implementation via future engagement with franchised operations. The sector recognizes the importance of applying the following defined metrics across franchised operations where possible, yet also acknowledges there are often legal or other limitations on the corporate entity's scope of influence. Nevertheless, franchised companies may seek to influence their franchisees for broader adoption of voluntary sustainability initiatives through various strategies, such as:

- 1) Demonstrating potential return on investment through implementation in company-owned operations
- 2) Value-chain-driven strategies (e.g., adopting standards in product specifications)
- 3) Adjustments to franchise agreements
- 4) Corporate-driven achievement awards focused on sustainability
- 5) Other franchise engagement strategies

### RETAIL AND FOOD SERVICE SECTOR SUSTAINABILITY ASSESSMENT GUIDE INDICATOR 5.1 WATER RESOURCES

METRICS	5.1. WATER RESOURCES
Level 1	5.1.1 Has the company assessed the water risk of its operations and locations?
Level 2	5.1.2a Does the company have a plan for water resource and risk management,
	including both quantity and quality impacts?
	5.1.2b Has the company assessed the water risk of its direct beef suppliers?
	5.1.2c Does the company engage suppliers and encourage adoption of the
	Framework's Water Resources Metrics in its beef value chain?
Level 3	5.1.3a1 Is the company participating in a credible system for reporting water
	stewardship?
	5.1.3a2 Has the company set water targets based on its assessments?
	5.1.3a3 Can the company demonstrate progress toward these targets?
	5.1.3b Does the company track performance on water stewardship in its beef value chain?
	chaint

**USRSB defines Water Resources as:** The volume of water used by a sector for each process, and any impacts on water quality by a sector for each process.

### **Desired Outcomes of Water Resources Metrics:**

- 1) Improved water planning, resource(s), management, and stewardship in retail and food service operations
- 2) Better collaboration between retail and food service operations and their suppliers on water stewardship
- 3) Greater understanding of issues surrounding water quality, scarcity, and risks that retail and food service operations and their value chains face
- 4) Broader engagement around common industry tools
- 5) Implement locally relevant strategies to mitigate risk in water scarce areas, including engagement in regional water planning and achievements in context-based water targets

### DESCRIPTION OF INDICATOR AND METRICS

Water is one of the world's most precious resources, but climate change, extreme weather, population changes, and aging water infrastructures threaten the future of water resources domestically and internationally. The World Economic Forum considers "water risk" one of the top five global risks in terms

of impact (World Economic Forum, 2018). Water risk is defined as the probability and severity of an entity experiencing a deleterious water-related event. The beef value chain is one of the many industries with a responsibility to be good stewards of water conservation.

Water resource initiatives have a far-reaching impact on sustainability, resource conservation, and the bottom line for businesses and homeowners. A 2014 U.S. Government Accountability Office Report cited 40 of 50 state water managers expect water shortages under average conditions in some portion of their states during the next decade (U.S. EPA, 2012b). In addition to water shortages, the demand and price for water continues to rise. This trend is expected to continue, making water conservation initiatives more important than ever.

Water use is also closely aligned with energy and greenhouse gas (GHG) emissions, as water is commonly used as a cooling system in the vast majority of electric power generation in the U.S. One way the Retail and Food Service Sector can address water use in electricity production is to focus on energy efficiency in buildings and equipment to reduce overall energy use. Retailers can also invest in renewable energy sources that do not depend on water (Union of Concerned Scientists Water-Smart Power, 2013).

Of the water used for U.S. commercial and industrial purposes, 15% is consumed by restaurants and used primarily for dishwashing and restroom facilities (U.S. EPA, 2017a). Utilizing water conservation practices can not only reduce overall water and energy use but can also decrease operating costs for restaurants by more than 10% (U.S. EPA, 2017a).

While improved water management is a target outcome for the Retail and Food Service Sector Water Resources Indicator, it is important to recognize that net water reduction is not always the desired objective, due to food handling and food safety priorities. For this reason, the metrics for this indicator are designed to highlight the importance of awareness, management, planning, continuous improvement, and broader engagement with suppliers, industry, and relevant stakeholders. The intent of these metrics is to identify resources for retail and food service operations to achieve strategic initiatives around water management and conservation.

### LEVEL 1 METRIC

Level	5.1.1 Water Resources Metric	Description
1	5.1.1 Has the company assessed the water risk of its operations and locations?	Operational
		Awareness

### GUIDANCE TO ACHIEVE THE METRIC

A detailed water risk assessment will establish the foundation for an operation to design and implement a water management plan. The water risk assessment will also provide a valuable water use benchmark for the company to compare against similar operations, including a foundation to track continual improvement of a company's own operation over time. Successful water resource and water risk management plans will vary from operation to operation.

### DESIRED OUTCOME

1) Completion of a water risk assessment that evaluates the operation's total water consumption and geographic water risk.

Level	5.1.2 Water Resources Metrics	Description
2	5.1.2a Does the company have a plan for water resource and risk	Programs to Address
	management, including both quantity and quality impacts?	Own Operations
	5.1.2b Has the company assessed the water risk of its direct beef	Programs that Include
	suppliers?	Supplier Collaboration
	5.1.2c Does the company engage suppliers and encourage adoption of	
	the Framework's Water Resources Metrics in its beef value chain?	

### GUIDANCE TO ACHIEVE THE METRICS

Overall improvement in water quality monitoring and reduction of water resource impacts in the company's beef value chain will be evident through implementing of and reporting on the Framework's Water Resources Metrics.

Water is an essential resource for food production, safe handling, and service for retail and food service operations. The majority of water use comes from equipment and kitchen operations, followed by restrooms (EPA, 2000). The Level 2 Water Resources Metrics for the Retail and Food Service Sector can be assessed based on the existence of water resource and water risk plans and the effectiveness of programs, partnerships, and technologies being used to reduce water usage in operations.

Successful strategies can include:

- 1) Improvement of processes to increase efficiency of water use
- 2) Voluntary partnerships with <u>WaterSense<sup>230</sup></u>, <u>WaterSense at Work<sup>231</sup></u>, and <u>ENERGY STAR<sup>232</sup></u> that have helped American families and businesses save billions of dollars
- Replacing fixtures, appliances, and equipment with products labeled water-efficient, including WaterSense and ENERGY STAR certified appliances that provide savings of 30% to 75% compared to standard products and practices (U.S. EPA, 2012a)

### DESIRED OUTCOME(S)

- 1) A written plan for water resource management and water risk management to implement solutions and programs that address water use and water quality impacts.
- 2) Policies that encourage similar practices in the Retail and Food Service Sector value-chain community, particularly around water conservation practices in the beef value chain.

Level	5.1.3 Water Resources Metrics	Description
3	5.1.3a1 Is the company participating in a credible system for reporting water	Measurement
	stewardship?	and Reporting
	5.1.3a2 Has the company set water targets based on its assessments?	
	5.1.3a3 Can the company demonstrate progress towards these targets?	
	5.1.3b Does the company track performance on water stewardship in its beef	Measurement
	value chain?	and Reporting

### LEVEL 3 METRICS

<sup>&</sup>lt;sup>230</sup>https://www.epa.gov/watersense/about-watersense

<sup>&</sup>lt;sup>231</sup>https://www.epa.gov/sites/production/files/2017-02/documents/watersense-at-work\_final\_508c3.pdf

<sup>&</sup>lt;sup>232</sup>https://www.energystar.gov/

### GUIDANCE TO ACHIEVE THE METRICS

The Level 3 Water Resources Metrics can be assessed based on the existence of an internal or external explicit target, and subsequent tracking against that target, to reduce or minimize water use.

Effective water management depends on operational and value-chain-level interactions. Transparency to consumers and shareholders toward water targets, including measuring and reporting progress toward those targets, is important to communicate progress and commitment to environmental stewardship. As each business is unique, transparency of water commitments and progress can be accomplished in various ways.

### DESIRED OUTCOME(S)

- 1) Continual improvement and accountability through concrete target setting and progress reporting.
- 2) Further water conservation practices by applying the same approach to the beef value chain.

### **TOOLS AND INFORMATIONAL RESOURCES**

Many resources on performing a water use audit are available from local or state utility providers and national experts. The following list is a starting point but is not exhaustive. USRSB does not own or manage these resources, but they are provided as potential helpful tools for value chain participants.

### Water Use Audit Resources

- 1) <u>Alliance for Water Efficiency<sup>233</sup></u>:
  - This resource provides a set of best practices for water resource management for specific sites within commercial operations. They are web-based documents with explanations of methods and approaches for each type of space in a food services operation, or for specific water resource conservation activities.
    - (1) Commercial food service<sup>234</sup>
    - (2) <u>Commercial restroom water audits<sup>235</sup></u>
    - (3) Graywater recovery  $\frac{236}{2}$
    - (4) <u>Supermarkets<sup>237</sup></u>
- 2) <u>California water efficiency suggestions for restaurant concepts</u><sup>238</sup>:
  - This resource provides two pages of activities and practices for water resource conservation within food services facilities.
- 3) Do it Yourself energy/water survey available from the Food Service Technology Center (FSTC)<sup>239</sup>:
  - The FSTC survey provides checklist activities for five spaces within a food services facility: Kitchen and Serving, Dining, Dish Area, Rooftop, and Parking Lot/Exterior.
- 4) ECO LAB Water Risk Monetizer<sup>240</sup>:

<sup>233</sup>http://www.allianceforwaterefficiency.org/

<sup>&</sup>lt;sup>234</sup>http://www.allianceforwaterefficiency.org/Commercial\_Food\_Service\_Introduction.aspx

<sup>&</sup>lt;sup>235</sup>http://www.allianceforwaterefficiency.org/commercial\_restroom\_audit.aspx

<sup>&</sup>lt;sup>236</sup>http://www.allianceforwaterefficiency.org/Package\_Graywater\_Recovery\_and\_Treatment\_Systems.aspx

<sup>&</sup>lt;sup>237</sup>http://www.allianceforwaterefficiency.org/Supermarket\_Introduction.aspx

<sup>&</sup>lt;sup>238</sup>http://www.water.ca.gov/wateruseefficiency/docs/Restaurants.pdf

<sup>&</sup>lt;sup>239</sup>http://fishnick.com/about/services/sitesurveys/FINAL\_N1360017\_FoodsrvEnergySurvey\_ENG.pdf

<sup>&</sup>lt;sup>240</sup>https://www.waterriskmonetizer.com/

- The valuable information in the Water Risk Monetizer can be used to help businesses better understand water risks and the potential cost implications of water quantity and quality at a particular facility. This resource can help assess different business models, determine how water costs or scarcity may affect growth plans, and help inform business goals.
- 5) <u>Environmental Defense Fund + Business Water Efficiency Toolkit<sup>241</sup></u>:
  - This site has created a water scorecard (assessment) and water efficiency calculator to help companies assess water efficiency and performance and to estimate water and financial savings in order to make a business case for a company's water efficiency initiatives.
- 6) <u>Hotel Conservation NYC NYC Environmental Protection Water for the Future (produced with support</u> from the Alliance for Water Efficiency)<sup>242</sup>:
  - The Hotel Conservation NYC Water for the Future guide is a regionally focused (New York City) water resource management and assessment guide for hotel and hospitality facilities.
- 7) National Restaurant Association (NRA) Conserve Program Water Management<sup>243</sup>:
  - The National Restaurant Association Conserve Program is a best management practices resource for food services facilities.
- 8) <u>Restaurant Managers Guide (RMG) to Water Efficiency NY Environmental Protection (produced in partnership with EPA WaterSense and the NY State Restaurant Association)<sup>244</sup>:</u>
  - The RMG is a regionally (New York City) focused water resource management and assessment guide for food service facilities.
- 9) Water Leak Cost Calculator, Food Service Technology Center (FSTC)<sup>245</sup>:
  - The FSTC water leak calculator is an online tool that uses a simple econometric approach to estimate costs of losses of water in a facility.
- 10) WaterSense Simple Water Assessment Checklist for Commercial and Institutional Facilities<sup>246</sup>:
  - The WaterSense checklist includes a commercial and institutional water assessment tool and a water use tracking tool. This set of assessment tools is formatted in MS-Excel spreadsheets, with supporting documentation and case studies.
- 11) World Wildlife Fund (WWF) AgWater Challenge<sup>247</sup>:
  - The WWF AgWater Challenge helps companies assess water risk in agriculture value chains against a set of Challenge Checklist criteria and identify areas ripe for improvement and action. WWF will also support Level 2 implementation; participants receive technical assistance from leading nongovernmental organizations with expertise on water risk assessment and water management strategies and have the opportunity to participate in peer-to-peer learning on best practices for managing water risks.

## Resources to determine a specific geographic water risk, including water scarcity and water quality (taken from the CEO Water Mandate)

1) <u>The GEMI Local Water Tool<sup>™</sup> (LWT)<sup>248</sup></u>:

242 http://www.nyc.gov/html/dep/pdf/conservation/housekeeping-booklet.pdf

<sup>&</sup>lt;sup>241</sup>http://business.edf.org/projects/featured/water-efficiency-and-att/water-efficiency-toolkit-2/

<sup>&</sup>lt;sup>243</sup>https://conserve.restaurant.org/Best-Practices/Save-Water

<sup>&</sup>lt;sup>244</sup>http://www.nyc.gov/html/dep/pdf/conservation/restaurant-managers-guide-to-water-efficiency.pdf

<sup>&</sup>lt;sup>245</sup>http://fishnick.com/savewater/tools/leakcalculator/

<sup>&</sup>lt;sup>246</sup>https://www.epa.gov/watersense/tools

<sup>&</sup>lt;sup>247</sup>https://www.worldwildlife.org/projects/the-agwater-challenge

<sup>&</sup>lt;sup>248</sup>http://www.gemi.org/localwatertool

- The Global Environmental Management Initiative (GEMI) developed this free tool to help companies and organizations evaluate the external impacts, business risks, opportunities, and management plans related to water use and discharge at a specific site or operation.
- 2) <u>The Water Footprint Assessment (WFA) Tool<sup>249</sup></u>:
  - This free online application helps users define their water footprint in a particular river basin or around a product, determine the impacts of that water footprint, and identify ways to reduce it.
- 3) <u>The Water Risk Filter</u><sup>250</sup>:
  - This free online tool developed by World Wildlife Fund (WWF), in collaboration with the German development bank Deutsche Investitions- und Entwicklungsgesellschaft, allows investors and companies from all industry sectors to assess and quantify water-related risks across the globe.
- 4) <u>The WBCSD Global Water Tool (GWT)<sup>251</sup></u>:
  - This free online module helps companies compare their water use, wastewater discharge, and facility information with validated watershed and country-level data (based on nearly 30 external datasets on water availability, sanitation, population, biodiversity information, etc.).
- 5) <u>World Resources Institute's (WRI) Aqueduct Tool</u><sup>252</sup>:
  - This publicly available online global database of local-level water risk indicators offers a global standard for measuring and reporting geographic water risk.

### CASE STUDIES

- 1) Alliance for Water Stewardship<sup>253</sup>
- 2) <u>CDP (formerly Carbon Disclosure Project) Water Survey<sup>254</sup></u>:
  - CDP's water questionnaire provides a robust framework for actions that companies can take to improve their corporate water stewardship, increasing their capability to identify, manage, and mitigate risk and capitalize on opportunities.
- 3) <u>CEO Water Mandate<sup>255</sup></u>:
  - The CEO Water Mandate mobilizes business leaders to advance water stewardship, sanitation, and the Sustainable Development Goals, in partnership with the United Nations, governments, peers, civil society, and others.
- 4) Equipment vendors:
  - Look for WaterSense labeled equipment when making new equipment purchases, as many equipment venders have established water risk management plans and/or water target goals and are demonstrating progress toward those goals.
- 5) Examples of water management plans from U.S. EPA buildings<sup>256</sup>
- 6) <u>Global Report Initiative (GRI) Water G4<sup>257</sup></u>:

<sup>252</sup>http://insights.wri.org/aqueduct/atlas

 $<sup>{}^{249}</sup> http://www.waterfootprint.org/?page=files/waterfootprintassessmenttool$ 

<sup>&</sup>lt;sup>250</sup>http://waterriskfilter.panda.org/

<sup>&</sup>lt;sup>251</sup>http://www.wbcsd.org/web/watertool.htm

<sup>&</sup>lt;sup>253</sup>http://a4ws.org/

<sup>&</sup>lt;sup>254</sup>https://www.cdp.net/en/water

<sup>&</sup>lt;sup>255</sup>https://ceowatermandate.org/about/mission-governance/

<sup>&</sup>lt;sup>256</sup>https://www.epa.gov/greeningepa/epas-water-management-plans

<sup>&</sup>lt;sup>257</sup>https://g4.globalreporting.org/specific-standard-disclosures/environmental/water/Pages/default.aspx

- GRI helps businesses and governments worldwide understand and communicate their impact on critical sustainability issues such as climate change, human rights, governance, and social wellbeing.
- 7) <u>A step-by-step guide to creating a water management plan<sup>258</sup></u>
- 8) <u>Leadership in Energy and Environmental Design (LEED) Certification Water Standards U.S. Green</u> <u>Building Council<sup>259</sup></u>
- 9) Local utilities:
  - The local city/town/county may have substantial information on water utilities, including a water report, water conservation reminders and restrictions, and more.
- 10) National Restaurant Association (NRA) Conserve Program: Water<sup>260</sup>
- 11) Additional water resource case studies from the World Business Council for Sustainable Development (WBCSD)<sup>261</sup>
- 12) Value-chain survey (created by the organization):
  - Understanding the value chain impacts on water resources is critical for an organization to manage risks and create opportunities for conservation of water. Surveys of value-chain activities are one way to achieve this outcome.
    - i) <u>Darden Example<sup>262</sup></u>
- 13) U.S. EPA's top 10 best water management techniques<sup>263</sup>
- 14) <u>Water risk filter example<sup>264</sup>:</u>
  - The Coca-Cola Company has launched a corporate standard that requires each of its 900+ bottling
    plants to evaluate the sustainability of the water resources used to produce its beverages, as well
    as the sustainability of the water resources used by the surrounding community.

# RETAIL AND FOOD SERVICE SECTOR SUSTAINABILITY ASSESSMENT GUIDE INDICATOR 5.2 LAND RESOURCES

METRICS	5.2 LAND RESOURCES
Level 1	5.2.1 Has the company assessed the deforestation risk to its beef value chain?
Level 2	<ul> <li>5.2.2a Is the retail/food service company working with organizations to support U.S. farmers and ranchers in developing and implementing grazing management plans?</li> <li>5.2.2b Does the company have a no net deforestation policy for its beef value chain?</li> </ul>

**USRSB defines Land Resources as:** The stewardship of terrestrial and aquatic habitat in relation to water, soil, and biodiversity in an area. Impacts of land use and land use conversion, both caused by and prevented by ranching and farming activities and other value-chain land use decisions.

<sup>260</sup>https://conserve.restaurant.org/Best-Practices/Save-Water/Water-service

<sup>&</sup>lt;sup>258</sup>https://energy.gov/eere/femp/best-management-practice-1-water-management-planning
<sup>259</sup>https://new.usgbc.org/leed

<sup>&</sup>lt;sup>261</sup>http://wbcsdpublications.org/category/water/

<sup>&</sup>lt;sup>262</sup>https://www.darden.com/citizenship/planet/energy-and-water-conservation

<sup>&</sup>lt;sup>263</sup>https://www.epa.gov/greeningepa/water-management-plans-and-best-practices-epa

<sup>&</sup>lt;sup>264</sup>http://waterriskfilter.panda.org/en/Mitigation#en/Mitigation/CaseStudies/7

### **Desired Outcomes of Land Resources Metrics:**

- 1) Preservation of the biological resources dependent on land that is currently being grazed
- 2) Minimized adverse environmental and social impacts of land resource uses
- 3) Beef production that drives land conservation practices

### DESCRIPTION OF INDICATOR AND METRICS

The Retail and Food Service Sector recognizes the important role cattle production and grazing can play in conserving natural landscapes, preserving natural habitat and improving the overall condition of land and soil health. Land resources provide critical ecosystem services, such as wildlife habitat, biodiversity, carbon storage, productivity and forage for livestock, water filtration, climate regulation, and clean air. Recognizing that retail and food service providers seldom have direct influence on significant land resource impacts through their operations, the Retail and Food Service Sector's Land Resources Metrics and guidance focus on a company's ability to influence its value chain.

Beef production is a global industry, and while the purview of the USRSB is the beef industry in the U.S., many large retailer and food service providers have international value chains that can adversely affect consumer trust in beef overall. In some beef-producing countries around the world, expansion of beef-producing areas has been identified as a driver of deforestation or land conversion in high conservation value areas. Sitting at the end of international and domestic value chains, U.S. retailer and food service providers have an important responsibility to their customers to make sure the beef they serve or sell comes from sources that protect areas with high conservation value and intact landscapes.

Domestically, expansion of row crop growing areas has also been identified as a driver of conversion of intact landscapes. For example, the World Wildlife Fund's <u>2017 Plowprint Report<sup>265</sup></u> shows that "from 2015-2016, approximately 2.5 million acres [of grasslands] were lost to crop production across the Great Plains." The conversion of these lands poses a real and significant threat to the wildlife that depend on them and increases carbon emissions and overall soil degradation. These row crops are often used for livestock feed, and U.S. animal agriculture industries will need to develop systems to ensure their feed demand is not leading to further conversion of these native landscapes. Without clear steps to measure progress for companies in the Retail and Food Service Sector, the scope of this indicator is limited to land impacted by grazing operations.

The most material way for retail and food service companies to positively influence the stewardship of land resources is to first understand their beef value chains and then use clear and effective sourcing policies. The Retail and Food Service Land Resources Metrics highlight the important role retailers and food service providers can play by engaging with their suppliers to understand where the beef they source is produced, as well as any potential risks associated with each origin.

### LEVEL 1 METRIC

Description

<sup>&</sup>lt;sup>265</sup>https://c402277.ssl.cf1.rackcdn.com/publications/1103/files/original/plowprint\_AnnualReport\_2017\_revWEB\_FINAL.pdf?1508 791901

1	5.2.1 Has the company assessed the deforestation risk to its beef value	Operational
	chain?	Awareness

### GUIDANCE TO ACHIEVE THE METRIC

Since deforestation of high conservation value forests has not been identified as a material risk for domestic beef production in the U.S., this metric only applies to companies sourcing both domestic and international beef.

Retail and food service operations conducting a deforestation risk assessment may want to consider the following process as an example of a way to approach such an assessment:

- 1) Identify points of origin for beef/countries you are sourcing from
  - Engage suppliers as a valuable resource for identifying origin countries
  - Are you sourcing beef from any countries outside of the U.S. and Canada?
    - i) If yes, proceed to #2
    - ii) If no, you do not fall within the scope of this metric. Retail/food service operations that do not fall in scope of this metric should still seek to understand their domestic value chains and consider policies and engagement strategies to support adoption of grazing management plans as outlined in the Framework's <u>Cow-Calf Sector SAG</u>
- 2) Cross reference list of origin countries against credible reports or organizations identifying countries where high conservation value resources or intact landscapes are being negatively affected by the expansion of beef production
  - Examples of credible sources or reports on countries where deforestation is associated with the expansion of beef production include but are not limited to:
    - i) World Wildlife Fund
    - ii) The Nature Conservancy
    - iii) University of Wisconsin Land Use and Environment Lab
  - If sourcing from a country where beef production has been associated with deforestation, it is important to gain more specific information about the regions you are sourcing from within that country and the variations of deforestation risk by region. Again, suppliers and credible nongovernmental organizations (NGOs) are valuable sources for this type of information.
- 3) Retail and food service operations sourcing beef from countries where beef production has been associated with deforestation are at risk of playing a role in furthering the conversion of these important native landscapes and should consider strategies to avoid or mitigate the risk of contributing to deforestation.

Such awareness enables retailers and food service providers to assess their purchasing practices and take concrete steps to avoid deforestation and land conversion/degradation risk from their value chains.

### DESIRED OUTCOME(S)

1) Retail and food service operations will better understand their beef value chains and any risks and how their value chains or purchasing practices could be contributing to the conversion of high conservation value ecosystems or intact landscapes (including the risk of deforestation).

Laval	E 2 2 Land Baseyman Matrice	Description
LEVEL 2	METRICS	

2	5.2.2a Is the retail/food service company working with	Programs that Include
	organizations to support U.S. farmers and ranchers in developing	Supplier Collaboration
	and implementing grazing management plans?	
	5.2.2b Does the company have a no net deforestation policy for	Programs that Include
	its beef value chain?	Supplier Collaboration

### GUIDANCE TO ACHIEVE THE METRICS

### Supporting Development and Implementation of Grazing Management Plans (GMPs):

The Retail and Food Service Sector can advance sustainability in the beef value chain by supporting U.S. farmers and ranchers in their development and implementation of GMPs, which are a powerful tool for improving water resources, land resources, air and GHG emissions, and business outcomes on farms and ranches. Education, training, and direct planning support are critical but so too are resources for implementing GMPs (e.g., lack of funds for on-ranch infrastructure like fences and stock water often limit implementation).

Retail and food service companies with domestic value chains could consider policies and strategies for industry engagement that support broader adoption of effective GMPs, as outlined in the <u>Framework's</u> <u>Cow-Calf Sector SAG</u>. The Retail and Food Service Sector can do this by supporting initiatives and working with existing organizations on the development of resources for GMPs. Such organizations include, but are not limited to, universities and agricultural extension service programs, a diverse set of NGO conservation organizations, consultants, state cattlemen's associations, and other state and federal agencies like the Natural Resource Conservation Service, the U.S. Forest Service, and the Bureau of Land Management. See the <u>Cow-Calf Sector GMP Tools and Informational Resources</u> for a more robust list of potential partners.

Documenting outcomes from the development and implementation of GMPs in value-chain pilot projects in which the Retail and Food Service Sector is engaged would also support and provide additional "proof of concept" for the efficacy of GMPs, especially for those value-chain participants not directly involved in farming or ranching. Sharing findings with U.S. farmers, ranchers, and other stakeholders would assist in building awareness of GMPs as a key tool for advancing sustainability in the U.S. beef value chain.

Overall, the Retail and Food Service Sector's support of initiatives that improve or increase access to highquality professional education and training programs on GMP development, as well as other resources such as funding and infrastructure development, will make adoption and practice of GMPs more durable and impactful.

### No Net Deforestation Policy Guidance:

Deforestation is one example of the larger issue of intact landscape loss. Therefore, credible deforestation policies should strive to protect a broad array of high conservation value resources and intact landscapes.

Deforestation policies specifically tailored for beef value chains should seek to support the local roundtables or organizations promoting beef sustainability where they exist in the countries where the risk was identified. Reviewing draft policies with credible NGO partners before publication is an important step for companies to take to both protect retail/food service brands and ensure that their policies are credible and comprehensive. While developing a policy, the retail/food service operation should determine how it will implement the policy and verify compliance with the policy in its value chain.

### DESIRED OUTCOME(S)

1) Increased use of GMPs on U.S. farms and ranches

- 2) Greater awareness and trust that the outcomes resulting from implementation of GMPs are valued by all actors in the U.S. beef value chain, including consumers
- 3) Implementation of a no net deforestation policy for the retail or food service operation's beef value chain

### TOOLS AND INFORMATIONAL RESOURCES

Examples of organizations and resources that could support companies with value-chain assessments and provide important points of reference that could be included in a company's deforestation policy include but are not limited to, the following list. USRSB does not own or manage these resources, but they are provided as potential helpful tools for value chain participants.

- 1) Acres for America<sup>266</sup>
- 2) Consumer Goods Forum Achieving Zero Net Deforestation<sup>267</sup>
- 3) Global Forest Watch Tool<sup>268</sup>
- 4) The New York Declaration on Forests<sup>269</sup>
- 5) The Sustainability Consortium Commodity Mapping Tool<sup>270</sup>
- 6) <u>TRASE<sup>271</sup></u>

### **Examples of deforestation policies:**

- 1) <u>Acres for America<sup>272</sup></u>
- 2) McDonald's Commitment on Forests<sup>273</sup>

### RETAIL AND FOOD SERVICE SECTOR SUSTAINABILITY ASSESSMENT GUIDE INDICATOR 5.3 AIR AND GREENHOUSE GAS EMISSIONS

METRICS 5.3 AIR AND GREENHOUSE GAS (GHG) EMISSIONS	
Level 1	5.3.1a Has the company assessed its Scope 1 and 2 GHG emissions?
Level 2	5.3.2a Does the company have a plan to reduce its Scope 1 and 2 GHG emissions?
	5.3.2b Has the company assessed the Scope 3 GHG emissions of its beef supply chain?
	5.3.2c Does the company engage suppliers and encourage adoption of the Framework's
	Air and GHG Metrics in its beef value chain?

commitments+and+achievements

<sup>268</sup>http://www.globalforestwatch.org/map/3/15.00/27.00/ALL/grayscale/loss,forestgain,forest2000?tab=analysis-tab&begin=2001-01-01&end=2017-01-01&threshold=30&dont analyze=true

<sup>269</sup>http://forestdeclaration.org/

<sup>&</sup>lt;sup>266</sup>http://www.nfwf.org/acresforamerica/Pages/home.aspx

 $<sup>^{267}</sup> https://www.the consumer goods for um.com/initiatives/environmental-sustainability/about/our-initia$ 

<sup>&</sup>lt;sup>270</sup>https://www.sustainabilityconsortium.org/projects/commodity-mapping/

<sup>&</sup>lt;sup>271</sup>https://trase.earth/

<sup>&</sup>lt;sup>272</sup>http://www.nfwf.org/acresforamerica/Pages/home.aspx

<sup>&</sup>lt;sup>273</sup>http://corporate.mcdonalds.com/mcd/sustainability/sourcing/priority-products/commitment-on-forests.html

Level 3	5.3.3a1 Is the company participating in a credible external reporting system for GHG
	emissions?
	5.3.3a2 Has the company set credible GHG emissions targets?
	5.3.3a3 Can the company demonstrate progress toward these targets?

**USRSB defines Air and GHG Emissions as:** The cumulative emissions of pollutants, including particulate matter, GHG, and other gaseous emissions from a sector for each process.

### **Desired Outcomes of Air and GHG Emissions Metrics:**

- 1) Increased awareness of GHG emissions and industry tools for mitigating emissions
- 2) Increased transparency and reporting of GHG emissions
- 3) More retail and food service operations working toward goals to reduce GHG emissions, informed by science

### DESCRIPTION OF INDICATOR AND METRICS

Climate change has been identified as one of the most important challenges that both human and natural systems will face in the coming decades. Emissions of GHG have been linked to climate change, and these emissions pose a significant risk to retail and food service operations and value chains.

Approximately 95% of the environmental footprint of a restaurant business is in the procurement of food (Baldwin et al., 2011). Figure 1 shows the distribution of energy use in retail and restaurant/food service. Retailers and food service providers should start to better understand their GHG consumption by addressing drivers of GHG emissions in their own operations, particularly the main drivers of energy use, water use, coolant leakage, and food waste. Finding cost-effective means to reduce these drivers will reduce GHG emissions and operational costs for the individual operations and the sector.



The following section provides resources to help retail and food service operations reduce their GHG emissions. The metrics provide the sector with key milestones for measuring progress across the spectrum of continuous improvement.

#### LEVEL 1 METRIC

Level	5.3.1 Air and Greenhouse Gases Metric	Description
1	5.3.1 Has the company assessed its Scope 1 and 2 GHG emissions?	Operational Awareness

### GUIDANCE TO ACHIEVE THE METRIC

The <u>Greenhouse Gas Protocol</u><sup>274</sup> classifies these types of emissions as a company's Scope 1 and Scope 2 emissions:

- **Scope 1 (Direct):** company facilities and company vehicles
- Scope 2 (Indirect): purchased electricity, steam, heating, and cooling for own use

The <u>Greenhouse Gas Protocol</u><sup>275</sup> provides an example of a standard method for assessing GHG emissions and provides definitions for Scope 1 and 2.

Retailers or food service providers assessing their energy use and the GHG emissions of their own operations may want to use calculators, consultants, or other tools. Free and for-fee resources are listed in the <u>Tools and Informational Resources</u> section.

Retailers or food service providers that have assessed their energy usage and Scope 1 and 2 GHG emissions should be able to 1) quantify their total Scope 1 and 2 emissions, 2) identify the largest sources of emissions in their operations, and 3) describe the tools or methodologies used to calculate their emissions.

The assessment frequency should be adequate to capture the impacts of changes in processes and practices that drive the indicator.

### DESIRED OUTCOME(S)

- 1) Provide a baseline understanding of energy use and GHG risks including:
  - Quantify total Scope 1 and 2 emissions
  - Identify the largest sources of emissions in operations
  - Describe the tools or methodologies used to calculate emissions

### LEVEL 2 METRICS

Level	5.3.2 Air and Greenhouse Gases Metrics	Description
2	5.3.2a Does the company have a plan to reduce its Scope 1 and 2	Programs to Address
	GHG emissions?	Own Operations
	5.3.2b Has the company assessed the Scope 3 GHG emissions of its	Programs that Include
	beef supply chain?	Supplier Collaboration

<sup>&</sup>lt;sup>274</sup>http://www.ghgprotocol.org/

<sup>&</sup>lt;sup>275</sup>http://www.ghgprotocol.org/

5.3.2c Does the company engage suppliers and encourage	Programs that Include
adoption of the Framework's Air and GHG Metrics in its beef value	Supplier Collaboration
chain?	

### GUIDANCE TO ACHIEVE THE METRICS

After establishing a baseline for Scope 1 and 2 GHG emissions, companies should create a plan to reduce emissions. Companies have the most control and influence over Scope 1 and 2 emissions, so those should be addressed first. A plan to reduce GHG emissions may include the following elements:

- 1) Baseline measurement and year
- 2) Reduction goal and timeline (e.g., "Company X aims to reduce its Scope 1 and 2 GHG emissions by XX% by 20XX")
- 3) Key steps focused on the largest sources of emissions
- 4) Roles, responsibilities, and resources to achieve the goal

Reducing water use and food waste are key strategies for reducing GHG emissions. Please see the <u>Water</u> <u>Resources</u> and the <u>Efficiency and Yield</u> SAGs for more guidance on these topics.

The retailer or food service provider should be able to describe the ways it engages with its value chain and encourage use of the Framework's metrics. Written policies, shared projects, business reviews, or records of communications with suppliers noting the roles of suppliers in the process and the importance of the Framework's metrics are examples of ways companies can demonstrate progress. Companies may also consider providing training for buyers on discussing GHG emissions and company expectations with suppliers or incorporating expectations around GHG emissions in new vendor qualification or selection.

The <u>Greenhouse Gas Protocol<sup>276</sup></u> classifies these types of emissions as a company's Scope 3 emissions.

- Scope 3 (Indirect): emissions across the entire value chain

Scope 3 emissions are difficult to measure because they occur beyond the company's direct influence and visibility. Retailers or food service providers assessing GHG emissions of their value chains (Scope 3) may want to use calculators, consultants, or other tools to help categorize and calculate these emissions. Please see the <u>Tools and Informational Resources</u> section for lists of free and paid resources that can help companies achieve the desired outcomes.

Companies that have assessed their Scope 3 GHG emissions should be able to 1) quantify their total Scope 3 emissions, 2) identify the largest sources of emissions in their operations, and 3) describe the tools or methodologies used to calculate their emissions.

### DESIRED OUTCOME(S)

- 1) Creation of a plan to reduce GHG emissions
- 2) Assessment of Scope 3 GHG emissions including:
  - Quantify their total Scope 3 emissions
  - Identify the largest sources of emissions in their operations
  - Describe the tools or methodologies used to calculate their emissions
- 3) Continuous improvement and integration of GHG reduction strategies into the company operations through use of tools such as environmental management systems

<sup>&</sup>lt;sup>276</sup>http://www.ghgprotocol.org/

4) Increased engagement and collaboration to reduce GHG emissions across the beef value chain

LEVEL 3 METRICS		
Level	5.3.3 Air and Greenhouse Gases Metrics	Description
3	5.3.3a1 Is the company participating in a credible external system	Measurement and
	reporting for GHG emissions?	Reporting
	5.3.3a2 Has the company set credible GHG emissions targets?	
	5.3.3a3 Can the company demonstrate progress toward these targets?	

### GUIDANCE FOR ACHIEVING THE METRICS

The assessment frequency should be adequate to capture the impacts of changes in processes and practices that drive the indicator.

Retailer or food service providers should be able to identify where and how they are reporting GHG emissions and discuss what makes the chosen reporting system credible. Examples of external systems for reporting GHG emissions include:

- 1) Carbon Disclosure Project (CDP)<sup>277</sup>
- 2) EPA's Greenhouse Gas Reporting Program (GHGRP)<sup>278</sup>
- 3) Company websites and annual reports

Credible targets should reflect the organization's responsibility to support societies' broader aspirations to minimize the adverse effects of climate change. Retailers or food service providers should understand what makes their targets credible. This may require third-party validation of their targets' credibility. The <u>Science Based Target Initiative</u><sup>279</sup> is one example of third-party validation for GHG reduction targets. Retailers and food service providers should be able to demonstrate progress toward targets through public reporting.

### DESIRED OUTCOME(S)

- 1) Increased transparency and participation in credible external systems for reporting and measuring GHG emissions against targeted goals and demonstrating progress against those goals
- 2) Broader engagement and collaboration with the full beef value chain to achieve meaningful GHG emissions reductions

### TOOLS AND INFORMATIONAL RESOURCES

The following resources are not intended to be an exhaustive list. USRSB does not own or manage these resources, but they are provided as potential helpful tools for value chain participants.

- 1) <u>CDP<sup>280</sup> (Carbon Disclosure Project)</u>: Climate Change Information Request:
  - The CDP has a set of questions that evaluate a company's resource usage, established goals, and management strategies, and also offers guidance documents, workshops, and webinars with

<sup>&</sup>lt;sup>277</sup>https://www.cdp.net/en

<sup>&</sup>lt;sup>278</sup>https://www.epa.gov/ghgreporting

<sup>&</sup>lt;sup>279</sup>http://sciencebasedtargets.org/

<sup>&</sup>lt;sup>280</sup>https://www.cdp.net/en/research/global-reports/tracking-climate-progress-2016

greater detail on what information to track and how to report it. The CDP report highlights several companies that have taken action toward addressing climate change, as well as details on the competitive advantage of reduced corporate emissions.

- 2) U.S. Department of Energy (DOE) Better Buildings Challenge<sup>281</sup>:
  - This DOE initiative aims to improve the lives of the American people by driving leadership in energy innovation in the nation's homes, commercial and public buildings, and industrial plants.
- 3) Energy savings calculators<sup>282</sup>
- 4) Environmental Defense Fund's <u>Roadmap to corporate GHG programs<sup>283</sup></u>
- 5) EPA<sup>284</sup>
  - ENERGY STAR<sup>285</sup>
    - i) <u>Building upgrade manual</u><sup>286</sup>: step-by-step instructions to increase a building's efficiency, including lighting and HVAC upgrades
    - ii) <u>Certified products<sup>287</sup></u> for HVAC
    - iii) C<u>ommercial light fixture<sup>288</sup> products</u>
    - iv) HVAC maintenance checklist<sup>289</sup>
    - v) <u>Portfolio Manager<sup>290</sup></u>: free software from that gives a 1–100 ENERGY STAR score; available for 21 different types of facilities
    - vi) Rebate finder and tax credits<sup>291</sup>
  - EPA GHG Inventory and Guidance for Low Emitters<sup>292</sup>
  - Green Power Partnership<sup>293</sup>
- 6) <u>Greenhouse Gas Protocol</u><sup>294</sup>:
  - A global, standardized structure for companies to adopt a comprehensive approach to measuring and tracking progress toward corporate climate goals. Resources available to companies include cross-sector tools, country-specific tools, sector-specific tools, and tools for countries and cities. Also available are step-by-step guides designed to assist tool users.
- 7) <u>GRI G4 Sustainability Reporting Guidelines<sup>295</sup></u>:
  - GRI shares these standards used by business, government, and other organizations to track and report impacts on the economic, social, and natural environment. These tools can help companies understand their risks and opportunities as well as benchmark and assess progress toward internal goals, industry standards, and global initiatives.

<sup>289</sup>https://www.energystar.gov/index.cfm?c=heat\_cool.pr\_maintenance

<sup>293</sup>https://www.epa.gov/greenpower/green-power-procurement-process

<sup>294</sup>http://www.ghgprotocol.org/calculation-tools

<sup>&</sup>lt;sup>281</sup>https://betterbuildingssolutioncenter.energy.gov/

<sup>&</sup>lt;sup>282</sup>https://caenergywise.com/calculators/

<sup>&</sup>lt;sup>283</sup>https://www.edf.org/sites/default/files/GHG\_roadmap\_Final.pdf

<sup>&</sup>lt;sup>284</sup>https://www.epa.gov/

<sup>&</sup>lt;sup>285</sup>https://www.energystar.gov/

<sup>&</sup>lt;sup>286</sup>https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/save-energy/comprehensive-approach/energy-star

<sup>&</sup>lt;sup>287</sup>https://www.energystar.gov/products/heating\_cooling/light\_commercial\_heating\_cooling

<sup>&</sup>lt;sup>288</sup>https://www.energystar.gov/products/lighting\_fans/commercial\_light\_fixtures

<sup>&</sup>lt;sup>290</sup>https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager/get-started-benchmarking

<sup>&</sup>lt;sup>291</sup>https://www.energystar.gov/about/federal\_tax\_credits

<sup>&</sup>lt;sup>292</sup>https://www.epa.gov/climateleadership/center-corporate-climate-leadership-ghg-inventory-guidance-low-emitters

<sup>&</sup>lt;sup>295</sup>https://www.globalreporting.org/information/g4/Pages/default.aspx

- 8) HVAC assistance
  - <u>10 Tips for Hiring a Heating and Cooling Contractor<sup>296</sup></u>
  - <u>Direct Fugitive Emissions from Refrigeration, Air Conditioning, Fire Suppression and Industrial</u> <u>Gases<sup>297</sup></u>, EPA
- 9) Managing Value-chain GHG Emissions: Lessons for the Road Ahead<sup>298</sup> (2010), EPA
  - The EPA has developed a set of case studies for value-chain management of GHG emissions that support the process defined in this SAG. These case studies demonstrate the relative value of each of the approaches for measuring GHG emissions within operational control.
- 10) <u>Technical Guidance for Calculating Scope 3 Emissions<sup>299</sup></u>, Greenhouse Gas Protocol
  - The Carbon Trust presents a very detailed value-chain assessment protocol for Scope 3 GHG emissions for corporations.

### **Retail-Specific Resources:**

- 1) <u>Retail Industry Leadership Association<sup>300</sup></u> (RILA) resources
  - <u>2017 Retail Energy Management Leadership Model<sup>301</sup></u>, a roadmap to help retail energy managers optimize their energy programs
  - Case study: <u>Belk, Inc. Seeing is believing LED pilot<sup>302</sup></u>
  - Energy Resource Library<sup>303</sup>
  - Energy Saving Opportunities and Tactics for Retail<sup>304</sup>

### Food Service-Specific Resources:

- 1) Energy Management Systems (EMS):
  - Computer-aided tools used by building operators to monitor, control, and optimize the
    performance of their energy use. Many companies offer EMS services that will install equipment
    or monitor utility data from multiple locations. Some companies are listed below (note: listing
    <u>does not</u> constitute an endorsement of any kind):
    - i) <u>Ecova<sup>305</sup></u>
    - ii) <u>Kitchen Brains<sup>306</sup></u>
    - iii) Powerhouse Dynamics<sup>307</sup>
    - iv) Sparkfund<sup>308</sup>
- 2) ENERGY STAR Commercial Food Service (EPA). <u>Guide for Cafes, Restaurants and Institutional</u> Kitchens<sup>309</sup>.

- <sup>297</sup> https://www.epa.gov/climateleadership/center-corporate-climate-leadership-direct-fugitive-emissions-refrigeration-air
- <sup>298</sup>https://www.epa.gov/sites/production/files/2015-07/documents/managing\_supplychain\_ghg.pdf
- <sup>299</sup>http://www.ghgprotocol.org/sites/default/files/ghgp/standards/Scope3\_Calculation\_Guidance\_0.pdf

<sup>305</sup>https://www.ecova.com/

<sup>&</sup>lt;sup>296</sup>https://www.energystar.gov/index.cfm?c=heat\_cool.pr\_contractors\_10tips

<sup>&</sup>lt;sup>300</sup>https://www.rila.org/Pages/default.aspx

<sup>&</sup>lt;sup>301</sup>https://www.rila.org/sustainability/RetailEnergyManagementProgram/Documents/2017 RILA Retail Energy Management Leadership Model.pdf

<sup>&</sup>lt;sup>302</sup>https://www.rila.org/sustainability/RetailEnergyManagementProgram/Documents/Belk IM - LEDs.pdf

<sup>&</sup>lt;sup>303</sup>http://www.retailcrc.org/sustainability/Pages/Retail-Energy-Resource-Library.aspx

<sup>&</sup>lt;sup>304</sup>https://www.rila.org/sustainability/RetailEnergyManagementProgram/Documents/EnergySavingOpportunities+TacticsforRetail .pdf#search=water%20use%20retail

<sup>&</sup>lt;sup>306</sup>https://www.kitchenbrains.com/products/

<sup>&</sup>lt;sup>307</sup>https://powerhousedynamics.com/

<sup>&</sup>lt;sup>308</sup>https://www.sparkfund.com/

<sup>&</sup>lt;sup>309</sup>https://www.energystar.gov/sites/default/files/asset/document/CR ES Restaurant Guide 2015 v8\_0.pdf

- 3) Food Service Technology Center<sup>310</sup> (FSTC):
  - Provides self-directed energy and water audits, but food service providers should also contact the local utility for a professional survey to get the most accurate information.
  - Other tools provided by the FSTC include:
    - i) Energy-efficient kitchen tool<sup>311</sup>
    - ii) Equipment calculators<sup>312</sup> (compare models' efficiency, cost savings by utility location)
    - iii) <u>Water efficiency best practices<sup>313</sup></u>
    - iv) <u>Kitchen ventilation<sup>314</sup></u>
    - v) Consider <u>Food Service Energy Efficiency Expert Certification<sup>315</sup></u> (paid service) for staff
- For an introduction to EMS systems, see Better Buildings' <u>Energy Management Systems for Food</u> <u>Service Applications<sup>316</sup></u>

### RETAIL AND FOOD SERVICE SECTOR SUSTAINABILITY ASSESSMENT GUIDE INDICATOR 5.4 EFFICIENCY AND YIELD

METRICS 5.4 EFFICIENCY AND YIELD		
Level 1	5.4.1 Has the company assessed food waste in its own operations?	
Level 2	5.4.2a Does the company have programs focused on reducing food waste in its operations, including beef waste?	
	5.4.2b Does the company have policies that encourage adoption of the Framework's metrics and enable suppliers to find alternative uses for safe, wholesome surplus products (beef, in particular)?	
Level 3	5.4.3a Does the company set targets and track performance of its food waste reduction programs, including beef?	
	5.4.3b Does the company engage its direct suppliers and track performance on food waste reduction in its beef value chain?	

**USRSB defines Efficiency and Yield as:** 1) Efficiency is expressed as the unit of input required to produce a unit of output, and 2) Yield is the total product generated per unit of time or space. Both concepts address waste as a negative characteristic and drive toward improved profitability.

### **Desired Outcomes of Efficiency and Yield Metrics:**

- 1) Food waste assessment conducted to make the organization aware of food loss and waste in its operations and to understand the opportunity for reduction or diversion from landfill
- 2) Implementation of programs that address food waste opportunities specific to the retail and food services operation

<sup>&</sup>lt;sup>310</sup>https://fishnick.com/about/services/sitesurveys/

<sup>&</sup>lt;sup>311</sup>https://fishnick.com/design/eek/

<sup>&</sup>lt;sup>312</sup>https://fishnick.com/saveenergy/tools/calculators/

<sup>&</sup>lt;sup>313</sup>https://fishnick.com/savewater/bestpractices/

<sup>&</sup>lt;sup>314</sup>https://fishnick.com/ventilation/demandventilation/

<sup>&</sup>lt;sup>315</sup>http://fethree.com/

<sup>&</sup>lt;sup>316</sup>https://betterbuildingssolutioncenter.energy.gov/sites/default/files/attachments/ems-guidance-for-food-service-applications\_0.pdf

- 3) Policies in place to encourage similar practices in the operation's value-chain community, particularly around preventing beef waste
- 4) Continual improvement and accountability through concrete target setting, tracking, and progress reporting, and ultimately, a measurable decrease in food wasted
- 5) Further food waste reductions by applying the same approach to the value chain

### DESCRIPTION OF INDICATOR AND METRICS

The beef value chain has a responsibility to minimize waste and ensure as much protein reaches its appropriate end destination to feed people rather than being diverted to a landfill. While numbers vary, it is estimated that 40% of food in the U.S. is lost or wasted annually, equal to 400 pounds per person and \$218 billion per year, or 1.3% of gross domestic product (GDP) (NRDC, 2017). Food waste has far-reaching impacts on food security, resource conservation, and climate change – 41.2 million Americans live in food insecure households (USDA, 2016). Up to one-fifth of cropland, fertilizer, and water used for agriculture is effectively wasted as it is used to grow food that is never eaten (ReFED, 2016). The number one contributor to landfills (by weight) is wasted food, which also accounts for 2.6% of U.S. GHG emissions (NRDC, 2017). Decreasing food waste will improve situations regarding food insecurity, wasted resources, and GHG emissions. In addition, the business case is clear; a recent study found a return on investment of 14:1, with the highest cost-ratio benefit occurring in restaurants and workplace canteens/dining centers (WRI & WRAP, 2017).



Figure 2: Food Recovery Hierarchy (U.S. EPA, 2017b)

In 2015, the U.S. announced a national goal to reduce food loss and waste 50% by 2030 (U.S. EPA, 2017c). This is in line with the global <u>Sustainable</u> <u>Development Goal<sup>317</sup></u> (SDG) of 12.3% and the food waste coalition <u>ReFED<sup>318</sup></u> which released a roadmap of solutions to cut food waste 20% by 2020 as a near-term milestone.

The Food Recovery Hierarchy, shown in Figure 2, prioritizes actions to prevent and divert wasted food as follows (in order of priority) (U.S. EPA, 2017b): 1) Source reduction (reducing the volume of surplus food generated)

2) Feeding hungry people (donating extra food to food banks, soup kitchens, and shelters)

These are the top two preferred options before

using food waste in the following ways: as animal feed, industrial use such as anaerobic digestion, rendering, fuel conversion, composting, and finally, sending it to a landfill. Not only does decreasing waste increase profitability but taking steps to decrease waste demonstrates the industry truly values the natural resources involved in producing beef and the nutritional value of beef to the human population. By

<sup>&</sup>lt;sup>317</sup>https://sustainabledevelopment.un.org/sdg12

<sup>318</sup>https://www.refed.com/

reducing food waste, the beef value chain is also positively influencing other indicators such as GHG emissions, land resources, and water resources.

More than 80% of food waste in the U.S. occurs at the consumer level (ReFED, 2016). While awareness of food waste is growing, a common misperception surrounds how much waste our Retail and Food Service Sector contributes, and thus, the ability of this sector to significantly impact food waste (Qi and Roe 2016; Neff et al. 2015). Retail and food service operations exist in every community, giving our sector a unique opportunity to tackle two macro issues in America, (1) reducing hunger and (2) reducing negative environmental impacts of food waste, by reducing food waste in this sector's facilities.

Given the diversity of operations within the Retail and Food Service Sector, collaboration on solutions and recommendations will ensure accurate reflection of the realities in sector operations and position efforts to increase success.

The following metrics provide guidance and resources for retail and food service operators interested in measuring, reducing, and tracking food waste as it relates to efficiency and yield.

LEV	ΈL	1	ME	TRIC
-----	----	---	----	------

Level	5.4.1 Efficiency and Yield Metric	Description
1	5.4.1 Has the company assessed food waste in its own operations?	<b>Operational Awareness</b>

### GUIDANCE TO ACHIEVE THE METRIC

The assessment can be performed either in-house or by professional waste management companies, utilizing scales for waste measurement. The <u>Tools and Informational Resources</u> section includes tools, frameworks, and assessments to enable food waste tracking and planning.

The assessment will show what, where, and why food is being lost and wasted, thus providing insight into what solutions may best fit the organization.

### DESIRED OUTCOME(S)

1) Conduct a food waste assessment to make the organization aware of food loss and waste in its operations and understand the opportunity for reduction or diversion from landfill

LEVEL	2	METRICS
-------	---	---------

Level	5.4.2 Efficiency and Yield Metrics	Description
2	5.4.2a Does the company have programs focused on reducing food	Programs to Address
	waste in its operations, including beef waste?	Own Operations
	5.4.2b Does the company have policies that encourage adoption of	Programs that Include
	the Framework's metrics and enable suppliers to find alternative	Supplier Collaboration
	uses for safe food, wholesome surplus products (beef, in	
	particular)?	

### GUIDANCE TO ACHIEVE THE METRICS

The Level 2 metrics can be assessed based on the existence and effectiveness of programs, partnerships, and technologies being used to reduce food waste in operations, as well as collaborations in the value chain. The <u>Tools and Informational Resources</u> section below provides solutions and guidance for reducing food waste, such as food donation.

### DESIRED OUTCOME(S)

- 1) Implementation of programs that address food waste opportunities specific to the retail and food services operation
- 2) Policies in place to encourage similar practices in the operation's value-chain community, particularly around preventing beef waste

### LEVEL 3 METRICS

Level	5.4.3 Efficiency and Yield Metrics	Description
3	5.4.3a Does the company set targets and track performance of its	Measurement and
	food waste reduction programs, including beef?	Reporting
	5.4.3b Does the company engage its direct suppliers and track	Programs that Include
	performance on food waste reduction in its beef value chain?	Supplier Collaboration

### GUIDANCE TO ACHIEVE THE METRICS

The Level 3 metrics can be assessed based on the existence of an internal or external explicit target on reducing or minimizing food waste accompanied by any internal or external tracking and reporting of performance against the target. Measurement and reporting should address beef waste if it is part of the organization's food waste stream, even in low quantities due to the additional impact of wasted beef.

The <u>Tools and Informational Resources</u> section below includes standardized tools for measuring and reporting on food waste.

### DESIRED OUTCOME(S)

- 1) Continual improvement and accountability through concrete target setting, tracking, and progress reporting, and ultimately, a measurable decrease in food wasted
- 2) Further food waste reductions by applying the same approach to the value chain

### TOOLS AND INFORMATIONAL RESOURCES

Many resources that help perform a waste audit are available, from consulting with your local hauler to national companies like Waste Management. The following is not an exhaustive list. USRSB does not own or manage these resources, but they are provided as potential helpful tools for value chain participants.

- 1) <u>Donate through Feeding America<sup>319</sup></u>:
  - Feeding America is a nonprofit organization that connects volunteers and restaurants with food banks at the community level.
- 2) <u>Donate through Food Donation Connection<sup>320</sup></u>:
  - This organization is a surplus food distribution program linked with hunger relief organizations and agencies.
- 3) Emerson Act Resources
  - Harvard Food Law and Policy Clinic and Natural Resources Defense Council (NRDC) guide for enhancing food donations<sup>321</sup>:

<sup>&</sup>lt;sup>319</sup>http://www.feedingamerica.org/

<sup>&</sup>lt;sup>320</sup>http://www.foodtodonate.com/

<sup>321</sup> https://www.chlpi.org/wp-content/uploads/2013/12/Dont-Waste-Donate\_-March-2017.pdf

- i) This document explores the Emerson Act in detail and provides a set of recommendations for implementation of the act.
- Information on the Bill Emerson Good Samaritan Act for liability protection of food donation<sup>322</sup>:
  - i) The Emerson Act, passed in 1996, "reduces potential donor liability and solves the problems created by a patchwork of various state laws through partial preemption. It also enables and encourages food recovery to help those that are food insecure.".
- 4) EPA resources for assessing wasted food<sup>323</sup>:
  - The U.S. EPA provides e-documents describing methods for performing food waste assessments, evaluating reduction strategies, and documenting performance.
- 5) <u>Find a composter<sup>324</sup></u>:
  - BioCycle has created this site to locate composters, anaerobic digesters, and other organic waste collection services in the U.S. and Canada. This site amplifies connections between food waste generators and those who can convert wastes to soil amendments.
- 6) <u>Food Loss and Waste (FLW) Protocol (Accounting and Reporting Standard)<sup>325</sup> and company case studies<sup>326</sup></u>:
  - The FLW protocol site provides a set of generic tools for any organization to measure food waste and food loss. These tools include reporting standards and spreadsheets. The case studies demonstrate the scale and implementation of these tools.
- 7) <u>Food Recovery Hierarchy<sup>327</sup></u>:
  - The Food Recovery Hierarchy is the standard for strategy development for food waste reduction.
- 8) <u>Food Recovery Verified</u><sup>328</sup>:
  - The FRV provides a certification program for organizations and enterprises who engage in food recovery programs.
- 9) Food Waste Reduction Alliance:
  - Food Waste Reduction Alliance (FWRA) industry assessments<sup>329</sup>:
    - i) This set of four industry-wide assessments, performed from 2012–2016, calculated food waste across each industry category.
  - FWRA best practices and emerging solutions toolkits<sup>330</sup>:
    - i) The FWRA provides links to about 20 resources, including FWRA's Best Practices and Emerging Solutions Guides. This is a good starting place for organizations beginning their food waste initiatives.
- 10) Further with Food resources 331:
  - The Center for Food Loss and Waste Solutions publishes this blog to communicate resources and challenges in food waste reduction.

11) Leanpath measurement and tracking tool<sup>332</sup>:

<sup>&</sup>lt;sup>322</sup>http://media.law.uark.edu/arklawnotes/2013/08/08/the-legal-guide-to-the-bill-emerson-good-samaritan-food-donation-act/
<sup>323</sup>https://www.epa.gov/sustainable-management-food/resources-assessing-wasted-food

<sup>&</sup>lt;sup>324</sup>http://www.findacomposter.com/

<sup>325</sup>http://flwprotocol.org/

<sup>&</sup>lt;sup>326</sup>http://flwprotocol.org/case-studies/

<sup>&</sup>lt;sup>327</sup>https://www.epa.gov/sustainable-management-food/food-recovery-hierarchy

<sup>&</sup>lt;sup>328</sup>https://www.foodrecoverynetwork.org/frv/

<sup>&</sup>lt;sup>329</sup> http://www.foodwastealliance.org/about-our-work/assessment/

<sup>&</sup>lt;sup>330</sup>http://www.foodwastealliance.org/about-our-work/solutions-best-practices/

<sup>&</sup>lt;sup>331</sup>https://furtherwithfood.org/

<sup>&</sup>lt;sup>332</sup>http://www.leanpath.com/

- Leanpath is a program for tracking and controlling food waste at the enterprise level. It has developed a tracking and analysis dashboard to support goal setting and collaboration.
- 12) LeanPath measurement and tracking tool<sup>333</sup>:
  - LeanPath has created a food waste assessment and tracking process for craft service companies, focusing on institutions, hospitals, and universities.
- 13) National Restaurant Association
  - National Restaurant Association best practices<sup>334</sup>:
    - i) This site provides resources and best management practices for food waste reduction, including waste stream audit methods.
  - National Restaurant Association guidance for conducting a waste-stream audit<sup>335</sup>:
    - i) This guide provides assessment methods and waste reduction best practices for restaurants in web-document formats.
- 14) ReFED
  - <u>ReFED information on waste tracking and analytics<sup>336</sup>:</u>
    - i) ReFED is a nonprofit organization that promotes date label standardization through a multistakeholder initiative, collecting data and generating insights on the innovation taking place to reduce food waste and centralizing food waste policies at the state and federal level.
  - ReFED Retail, Restaurant, and Food Service Food Waste Action Guides<sup>337</sup>:
    - i) The ReFED Waste Action Guides are a set of comprehensive resources for food recovery strategies.
- 15) Safe Food Alliance What is HACCP?<sup>338</sup>
- **16)** <u>Sustainability Accounting Standards Board (SASB) food waste management standards for food</u> retailers and distributors (consumption II sector)<sup>339</sup> and restaurants (services sector)<sup>340</sup>:
  - SASB standards are composed of (1) disclosure guidance and (2) accounting standards on sustainability topics for use by U.S. and foreign public companies in their annual filings (Form 10-K or 20-F) with the U.S. Securities and Exchange Commission (SEC).
- 17) <u>Waste audit Excel worksheet from EPA<sup>341</sup>:</u>
  - This site provides another access point for the EPA's MS-Excel spreadsheet for waste audits.
- 18) World Resources Institute (WRI)<sup>342</sup>:
  - WRI collected a series of case studies and strategies for food waste reduction at all scales, from household to institution.

### CASE STUDIES

1) Kroger: Zero Hunger Zero Waste Program<sup>343</sup>

- <sup>335</sup>http://conserve.restaurant.org/Best-Practices/Reduce-Waste-Recycle/Do-A-Waste-Stream-Audit
- <sup>336</sup>http://www.refed.com/solutions/waste-tracking-and-analytics
- <sup>337</sup>http://www.refed.com/download

<sup>342</sup>https://www.wri.org/tags/food-waste

<sup>&</sup>lt;sup>333</sup>http://www.leanpath.com/

<sup>&</sup>lt;sup>334</sup>http://conserve.restaurant.org/Best-Practices/Reducing-Food-Waste

<sup>&</sup>lt;sup>338</sup>https://safefoodalliance.com/resources/food-safety-resources/haccp-overview/

<sup>&</sup>lt;sup>339</sup>https://www.sasb.org/standards/download/consumption-2-standards-download/

<sup>&</sup>lt;sup>340</sup>https://www.sasb.org/standards/download/services/

<sup>&</sup>lt;sup>341</sup>http://conserve.restaurant.org/Downloads/PDFs/Conserve-energy/waste-audit-form\_EPA.aspx

<sup>&</sup>lt;sup>343</sup>https://thekrogerco.com/sustainability/zero-hunger-zero-waste/

- 2) <u>Pizza Hut's Harvest Food Donation Program<sup>344</sup></u>
- 3) <u>Sodexo's Position on Food Waste and WasteWatch initiative<sup>345</sup></u>

Retail and food service companies have also contributed to recent studies and thought leadership on reducing food waste in the sector, including:

- 4) <u>Food waste measurement collaborative organized by the Oregon State Department of Environmental</u> Quality<sup>346</sup>
- 5) NRDC's study of food waste and potential for food rescue in three major U.S. cities<sup>347</sup>
- 6) Supporting policies that enable food donation with the <u>Food Law and Policy Clinic of Harvard Law</u> <u>School<sup>348</sup></u>
- 7) <u>WWF's pilot projects and toolkit<sup>349</sup></u> to reduce food waste at full-service brand hotels and independent operations

### RETAIL AND FOOD SERVICE SECTOR SUSTAINABILITY ASSESSMENT GUIDE INDICATOR 5.5 ANIMAL HEALTH AND WELL-BEING

METRICS	METRICS 5.5 ANIMAL HEALTH AND WELL-BEING		
Level 1	5.5.1a Does the company have a documented and publicly available animal care and		
	handling policy?		
	5.5.1b Does the company encourage the adoption of the Framework's metrics in its beef		
	value chain?		
Level 2	5.5.2b Does the company verify compliance with its policy at least to the packer level?		
	5.5.2c Does the company have a policy for audit failures?		
Level 3	5.5.3a Does the company engage its suppliers on continuous improvement and emerging		
	issues regarding animal health and well-being in its beef value chain?		
	5.5.3b Does the company track and assess progress on animal health and well-being		
	outcomes that align with its policy?		

**USRSB defines Animal Health and Well-being as:** The cumulative effects of cattle heath, nutrition, care and comfort.

### **Desired Outcomes of Animal Health and Well-being Metrics:**

- 1) Documented animal care and handling policy
- 2) Verification of humane handling and stunning at the packer level

<sup>&</sup>lt;sup>344</sup>http://blog.pizzahut.com/pizza-hut-surpasses-100-million-pounds-food-donated-harvest-program/

<sup>&</sup>lt;sup>345</sup>http://www.sodexousa.com/home/corporate-responsibility/sustainable-development/environment/materials-and-waste/organic-waste.html

<sup>&</sup>lt;sup>346</sup>https://www.oregon.gov/deq/FilterDocs/WastedFoodStudyTask1.pdf

<sup>&</sup>lt;sup>347</sup>https://www.nrdc.org/issues/food-waste

<sup>&</sup>lt;sup>348</sup>https://hls.harvard.edu/dept/clinical/clinics/food-law-and-policy-clinic-of-the-center-for-health-law-and-policy-innovation/ <sup>349</sup>https://hotelkitchen.org/

3) More collaboration with suppliers to continually improve animal health and well-being throughout the beef value chain

### DESCRIPTION OF THE INDICATOR AND METRICS

The Retail and Food Service Sector plays an important role in the beef value chain by interacting with consumers directly, listening to their needs, and providing the beef products they desire. Although the Retail and Food Service Sector does not directly interact with live animals, their health and well-being play an important role in being a responsible business, delivering consistent, quality products, and meeting changing consumer and other stakeholder expectations. The sector takes this responsibility seriously and is committed to engaging its suppliers to monitor the health and well-being of the animals in their value chain. The Retail and Food Service Sector collectively support the Five Freedoms for Farm Animal Welfare:

- 1) Freedom from hunger and thirst
- 2) Freedom from discomfort
- 3) Freedom from pain, injury, or disease
- 4) Freedom to express normal behavior
- 5) Freedom from fear and distress

Animal health and well-being is one of the top sustainability concerns across different retail and food service stakeholder groups, including consumers, shareholders, and advocacy groups. According to a recent survey, nearly 60% of U.S. consumers are more concerned with farm animal humane handling than they were a few years ago, including how farm animals are raised, handled, and slaughtered, and their housing, feed, and antibiotic use (Packaged Facts, 2017).

Shareholders are also increasingly engaged on these topics, and in 2016, animal care (antibiotic stewardship, specifically) was one of the top two sustainability topics featured in shareholder proposals (Packaged Facts, 2017). Shareholder advocacy groups such as the Farm Animal Investment Risk and Return<sup>350</sup> (FAIRR) initiative provide investors with guidance to mitigate investment risks related to animal health and well-being, along with antibiotic use (e.g., operational disruptions due to regulatory changes, evolving consumer awareness, and preferences, etc.), and have put an explicit focus on the retail and restaurant sector. Other advocacy groups continue to influence the sector through targeted campaigns or strategic partnerships to establish robust animal health and well-being policies and targets, as well as to measure and disclose progress.

In an effort to be more transparent and demonstrate progress over time, more companies are establishing animal health and well-being policies and targets (or making public what was previously internal information).

#### LEVEL 1 METRIC

Level	5.5.1 Animal Health and Well-being Metric	Description
1	5.5.1a Does the company have a documented and publicly	Operational Awareness
	available animal care and handling policy?	

### GUIDANCE TO ACHIEVE THE METRIC

An animal care and handling policy communicates the key values for a company and its stance on animal care. The policy is an indication that the retail food service operation has placed prerequisite thought into the health and well-being of beef animals in its value chain. The content of the animal care policy is determined by the participating retail and food service operations; however, the policy should address key standards and practices employed through the value chain and procurement process. More information on recommended standards of practice can be found at the <u>Beef Quality Assurance (BQA) website<sup>351</sup></u>.

The assessment of this Level 1 metric is straightforward: the company must have an animal care and handling policy publicly available, typically published on a website. The statement should focus on key animal health and well-being outcomes, but the specific content is up to the company (refer to the <u>Tools</u> and <u>Informational Resources</u> section).

#### DESIRED OUTCOME

1) Creation of publicly available animal care and handling policy (or similar)

#### LEVEL 2 METRICS

Level	5.5.2 Animal Health and Well-being Metrics	Description
2	5.5.2a Does the company encourage the adoption of Framework's metrics in its	Programs
	beef value chain?	that Include
	5.5.2b Does the company verify compliance with its policy at least to the	Supplier
	packer level?	Collaboration
	5.5.2c Does the company have a policy for audit failures?	

### GUIDANCE TO ACHIEVE THE METRICS

The Level 2 metrics for the Retail and Food Service Sector can be assessed internally or as part of a larger program assessed by second- or third-party audits. The level of detail collected for compliance monitoring will depend on the depth and detail listed in the animal care and handling policy. This could be completed by the retail or food service company doing its own animal care audit or by utilizing a third party. In most cases, having a third party outside of the supply chain evaluate the compliance provides the highest level of transparency and accountability and meets evolving stakeholder expectations.

Completing the Level 2 metrics results in an assessment system to evaluate compliance with the overall policy; therefore, this system should also contain a policy for dealing with audit failures. The assessment criteria should clearly provide an indication if compliance was achieved or not (success or failure). The audit should be based on widely recognized <u>North American Meat Institute (NAMI) standards<sup>352</sup></u>.

For audits that dive deeper into the beef value chain to the feedlot and on-farm audits, USRSB recommends utilizing best management standards from <u>BQA</u><sup>353</sup> as an audit assessment tool. When failures occur, the company should have a policy for appropriate corrective actions. For example, if an animal care audit revealed the company policy was not appropriately followed in the value chain (resulting in an audit

<sup>351</sup> http://www.bqa.org/

<sup>&</sup>lt;sup>352</sup>http://www.animalhandling.org/

<sup>353</sup>https://www.bqa.org/

failure), the company could have a policy that the first step is additional training to be implemented at the value-chain level, followed by a re-audit within an appropriate timeframe.

As each organization's animal care and handling policy may have differing metrics or criteria for success, each company could create a customized assessment tool based on its system. This could be as simple as a worksheet, form, or survey that evaluates compliance with the policy.

### DESIRED OUTCOME(S)

- 1) The retail/food service operation has a mechanism to verify compliance with the animal care and handling policy, at least to the packer level
- 2) The policy includes a solution for dealing with audit failures and subsequent corrective action
- 3) The retail/food service operation has internal alignment to refer to the Framework's metrics with its beef value chain

### LEVEL 3 METRICS

Level	5.5.3 Animal Health and Well-being Metrics	Description
3	5.5.3a Does the company engage its suppliers on continuous	Measurement and
	improvement and emerging issues regarding animal health and well-	Reporting
	being in its beef value chain?	
	5.5.3b Does the company track and assess progress on animal health and well-being outcomes that align with its policy?	

### GUIDANCE TO ACHIEVE THE METRICS

Engaging in continuous improvement requires a commitment on the part of the retailer and food service provider to have an ongoing dialogue about cattle well-being and health throughout the animals' lifecycle. One way to express this commitment to continued evaluation is the formation of a standing group or committee to evaluate emerging issues and current policies, as well as the implications for the company and the value chain. Ideally, this committee would involve stakeholders beyond the company, potentially including representatives of value-chain members, experts in cattle well-being, and animal well-being auditors. Including the full beef value chain in this process may help gather information on the entire beef production system. The work of this group or council could be documented through meeting minutes as well as written reports.

Tracking and assessing progress toward cattle well-being goals at the packer and processor level (at a minimum) can be an important way to determine the success of beef cattle well-being policies. This can be achieved by collecting and recording animal auditor reports from the third-party auditor.

### DESIRED OUTCOME(S)

- 1) Continual improvement in managing animal health and well-being through the beef value chain
- 2) A method to track and assess progress on animal health and well-being outcomes at the packer level to ensure progress toward alignment with programs such as the NAMI animal handling policy

### TOOLS AND INFORMATIONAL RESOURCES

Several resources are available to utilize when creating an animal care and handling policy. The retailer/food service company should engage with key stakeholders and experts to determine the best

policy for its procurement system and value chain. The scope of the policy may vary based on specific types of products purchased. Examples of policies and case studies can be found at the end of this section.

Principles of animal health and well-being are outlined through <u>the BQA program<sup>354</sup></u>. These principles can also be reviewed in the <u>Cow-Calf Sector</u> and <u>Feedyard Sector</u> of the Framework document. Professional organizations and national industry groups also have resources that may be of assistance, including contact with experts in the area. USRSB does not own or manage these resources, but they are provided as potential helpful tools for value chain participants. Potential resources include:

- 1) Academy of Veterinary Consultants<sup>355</sup>:
  - Professional association of primarily beef cattle veterinarians with focus on feedlot; contains specific animal health and welfare committee.
- 2) American Association of Bovine Practitioners<sup>356</sup>:
  - Professional association of cattle veterinarians in the U.S. and international; has a specific animal health/animal welfare committee.
- 3) Beef Research<sup>357</sup>:
  - Ecosystem services 358
  - Water usage<sup>359</sup>
  - Carbon sequestration<sup>360</sup>
  - Greenhouse gas impact<sup>361</sup>
  - Methane emissions<sup>362</sup>
- 4) External third-party audits can be a useful tool in the monitoring and verification process to a level of detail based on the scope of the initial animal welfare policy; several organizations exist that provide this service, including:
  - Professional Animal Auditor Certification Organization (PAACO)<sup>363</sup>, which provides a service to certify animal auditors as well as review and certify auditing instruments, assessments, and programs.
- 5) International Organization for Standardization (ISO):
  - Technical Specification 34700: Animal Welfare Management General Requirements and Guidance for Organizations in the Food Value-chain: The purpose of this document is to ensure the welfare of animals raised for food production around the world. It supports the implementation of animal welfare principles; provides guidance for the implementation of public or private animal welfare standards; and facilitates the integration of animal welfare principles in business-to-business relationships.
- 6) NAMI Animal Handling Criteria<sup>364</sup>

<sup>358</sup>https://www.beefresearch.org/sustainability/index.html

<sup>&</sup>lt;sup>354</sup>http://www.bqa.org/

<sup>&</sup>lt;sup>355</sup>http://www.avc-beef.org/

<sup>&</sup>lt;sup>356</sup>http://www.aabp.org/

<sup>&</sup>lt;sup>357</sup>http://www.beefresearch.org/

<sup>&</sup>lt;sup>359</sup>https://www.beefresearch.org/sustainability/q02/index.html

<sup>&</sup>lt;sup>360</sup>https://www.beefresearch.org/sustainability/q04/index.html

<sup>&</sup>lt;sup>361</sup>https://www.beefresearch.org/sustainability/q12/index.html

<sup>&</sup>lt;sup>362</sup>https://www.beefresearch.org/sustainability/q17/index.html

<sup>&</sup>lt;sup>363</sup>http://www.animalauditor.org/

<sup>&</sup>lt;sup>364</sup>http://www.animalhandling.org/

- 7) <u>NAMI Animal Welfare Criteria<sup>365</sup></u>
- 8) National Cattlemen's Beef Association<sup>366</sup>:
  - Industry trade association of cattle producers and related education info; maintains <u>Beef Quality</u> <u>Assurance<sup>367</sup></u> program.
- 9) North American Meat Institute<sup>368</sup>:
  - Non-profit industry trade association providing assistance to meat packers and processors; contains animal health committee and includes <u>links specific to animal health and welfare<sup>369</sup></u>

Professional organizations and national industry groups also have resources that may be of assistance, including contact with experts in the area. Potential resources include:

- 1) <u>Antibiotic Stewardship for Beef Producers</u><sup>370</sup>:
  - BQA Antibiotic Standards provide a code of practice for responsible, judicious, and humane use of antibiotic by beef producers.
    - i) Judicious Use Practices 371
- 2) BQA National Manual<sup>372</sup>:
  - The BQA goals are to "ensure the consumer that all cattle shipped from a beef production unit are healthy, wholesome and safe, their management has met FDA, USDA and EPA standards, they meet quality requirements throughout the production system and are produced with environmentally-sound production practices."
- 3) BQA Cattle Care and Handling Guidelines<sup>373</sup>:
  - These guidelines provide a code of cattle care for producers to ensure the humane and safe treatment of cattle in the beef value chain.

### CASE STUDIES

- 1) <u>Wendy's Animal Welfare Program<sup>374</sup></u>
  - Wendy's approach includes "purposeful sourcing," traceability, and internal and external auditing with the help of a long-standing animal welfare council.

### RETAIL AND FOOD SERVICE SECTOR SUSTAINABILITY ASSESSMENT GUIDE INDICATOR 5.6 EMPLOYEE SAFETY AND WELL-BEING

<sup>&</sup>lt;sup>365</sup>https://www.fsis.usda.gov/wps/wcm/connect/da6cb63d-5818-4999-84f1-72e6dabb9501/Comp-Guide-Systematic-Approach-Humane-Handling-Livestock.pdf?MOD=AJPERES

<sup>&</sup>lt;sup>366</sup>http://www.beefusa.org/

<sup>367</sup>http://www.bqa.org/

<sup>&</sup>lt;sup>368</sup>https://www.meatinstitute.org/

<sup>&</sup>lt;sup>369</sup>https://www.meatinstitute.org/index.php?ht=d/sp/i/243/pic/243

<sup>&</sup>lt;sup>370</sup>https://www.bqa.org/Media/BQA/Docs/bqa\_antibiotics\_final.pdf

<sup>371</sup> https://www.bqa.org/Media/BQA/Docs/judiciousmicrobials.pdf

<sup>&</sup>lt;sup>372</sup>https://www.bqa.org/Media/BQA/Docs/nationalmanual.pdf

<sup>&</sup>lt;sup>373</sup>https://www.bqa.org/Media/BQA/Docs/cchg2015\_final.pdf

<sup>&</sup>lt;sup>374</sup>https://www.wendys.com/animal-welfare-program
METRICS 5.6 EMPLOYEE SAFETY AND WELL-BEING				
Level 1	5.6.1a1 Does the company have clearly documented policies and procedures around			
	employee workplace safety and training programs?			
	5.6.1a2 Does the company require training on food safety and handling techniques for			
	beef?			
Level 2	5.6.2 Does the company have a supplier code of conduct (or equivalent) that includes			
	employee health and safety policies, and have a system for tracking compliance of its			
	beef suppliers?			
Level 3	5.6.3 Does the company track the number of direct company employees (not supply			
	chain) completing safety and training programs?			

**USRSB defines Employee Safety and Well-being as:** The implementation of safety programs and training to provide a safe workplace and help to prevent workplace accidents and injuries associated with production, processing, and distribution of beef and the relative prosperity of workers employed in those activities.

## Desired Outcomes of Employee Safety and Well-being Metrics:

- 1) Overall improved employee safety
- 2) Defined policies, procedures, and training programs that promote a safe work environment
- 3) Defined training program for direct company employees that includes food safety training and handling around beef
- 4) Delivery of benefits and resources that support employee health and well-being
- 5) Improved worker injury rates as compared to industry standards
- 6) Improved tracking of employee safety, training, and engagement (e.g., participation in programs, engagement of resources, outcome measures)

## DESCRIPTION OF THE INDICATOR AND METRICS

Employee safety, training, and well-being are essential to accomplish day-to-day business operations. The metrics for this indicator are designed to build a work culture that includes robust safety and training programs along with focusing on the safe handling of beef.

Retail and food service organizations cannot be sustainable for long-term success without protecting the safety, health, and welfare of their most vital resource: **workers**.

Organizations of all sizes have embraced this mindset to showcase their values and to measure impacts and outcomes, which in turn builds a culture and workplace of choice. However, workplace safety, training, and health can often be underemphasized or overlooked. Integrating health and safety training provides an opportunity to better protect workers and achieve a truly sustainable organization.

The following metrics provide guidance and resources for retail and food service organizations interested in implementing and measuring employee safety and training programs.

#### LEVEL 1 METRICS

Level 5.6.1 Employee Safety and Well-being Metrics	Description
--	-------------

1	5.6.1a1 Does the company have clearly documented policies and procedures	Operational
	around employee workplace safety and training programs?	Awareness
	5.6.1a2 Does the company require training on food safety and handling	
	techniques for beef?	

## GUIDANCE TO ACHIEVE THE METRICS

A variety of professional resources are focused on restaurant and retail operators to support the development and implementation of employee safety and training programs. Some of these include:

- 1) Code of conduct
- 2) Onboarding and orientation training
- 3) Food safety training (e.g., ServSafe or equivalent program)
- 4) Specific Standard Operating Procedures (SOPs) for handling beef (e.g., procedures for storing, thawing, and cooking beef; cleaning utensils and equipment such as a grill; hand washing)
- 5) Workplace safety training
- 6) First aid and CPR training
- 7) Hazard communication program
- 8) Security training
- 9) Prevention of workplace violence

These policies and procedures should allow for dialogue between workers and management and foster a partnership to achieve the shared goals of a safe, healthy, productive workplace (OSHA, 2018).

#### DESIRED OUTCOME(S)

- 1) Documented policies, programs, and procedures for workplace safety training and food safety training
- 2) SOPs around handling and managing beef to prevent food safety issues, unnecessary food waste, and foodborne illness

#### LEVEL 2 METRIC

Level	5.6.2 Employee Safety and Well-being Metric	Description
2	5.6.2 Does the company have a supplier code of conduct (or equivalent)	Programs that
	that includes employee health and safety policies and have a system for	Include Supplier
	tracking compliance of its beef suppliers?	Collaboration

#### GUIDANCE TO ACHIEVE THE METRIC

Considerations for a company to address in a supplier code of conduct include:

- 1) Labor standards and practices, including working hours, freely chosen employment, compensation, child labor, freedom of association, non-discrimination, and health and safety
- 2) Environmental policy, including use of raw materials and product and efficient transportation technology
- 3) Ethics, including anti-corruption measures, fair business practices, etc.
- 4) Documentation and review policy, including information on how the code will be monitored and reviewed
- 5) Grievance mechanisms that allow employees to confidentially and easily report concerns

To track compliance with suppliers, the company could do the following:

- 1) Self-audits by the supplier consider developing a checklist for suppliers to use
- 2) Audit by an internal team

3) Audit by an external consultant

## DESIRED OUTCOME(S)

- 1) Implementation of a supplier code of conduct (or equivalent) that addresses the employee health and safety of the suppliers
- 2) Implementation of a system for tracking beef supplier compliance with the code of conduct

#### LEVEL 3 METRIC

Level	5.6.2 Employee Safety and Well-being Metric	Description
3	5.6.3 Does the company track the number of company employees	Measurement
	completing safety and training programs?	and Reporting

## GUIDANCE FOR ACHIEVING THE METRIC

Tracking the number of company employees completing training programs can assist in identifying any gaps that may remain. If the majority of employees are completing training programs and yet safety issues continue to exist, it could indicate the need to reevaluate the training program.

The implementation of the Level 3 metric for the Retail and Food Service Sector will allow for continual improvement and accountability through concrete tracking and reporting of employees completing safety and training programs. It may also lead to other benefits, such as further food waste reductions as a result of implementing and monitoring training around food safety and handling.

#### DESIRED OUTCOME(S)

1) Documentation tracking the number of employees completing safety and training programs

## TOOLS AND INFORMATIONAL RESOURCES

The following resources are not intended to be an exhaustive list. USRSB does not own or manage these resources, but they are provided as potential helpful tools for value chain participants.

- 1) American Red Cross CPR and first-aid training<sup>375</sup>
- 2) Beef Industry Food Safety Council (BIFSCO):
  - Food service resources<sup>376</sup>
    - Retail resources<sup>377</sup>
- 3) Global Impact Investing Rating System (GIIRS) Resource Guide: Creating Supplier Code of Conduct<sup>378</sup>
- 4) <u>Global Reporting Initiative, Social Standards<sup>379</sup></u> (including Occupational Health and Safety, Training and Education, etc.)
- 5) <u>Good example of a supplier code of conduct from Ethical Trading Initiative<sup>380</sup></u>
- 6) <u>Good example of a supplier code of conduct from Fair Labor Association<sup>381</sup></u>

<sup>&</sup>lt;sup>375</sup>https://www.redcross.org/take-a-class

<sup>&</sup>lt;sup>376</sup>http://www.bifsco.org/resources.aspx#foodservice

<sup>&</sup>lt;sup>377</sup>http://www.bifsco.org/resources.aspx#retail

<sup>&</sup>lt;sup>378</sup>https://www.bcorporation.net/sites/default/files/documents/bestpractices/EM\_Creating\_a\_Supplier\_Code\_of\_Conduct.pdf <sup>379</sup>https://www.globalreporting.org/standards/gri-standards-download-center/

<sup>&</sup>lt;sup>380</sup>https://www.ethicaltrade.org/eti-base-code

<sup>&</sup>lt;sup>381</sup>http://www.fairlabor.org/our-work/code-of-conduct

- 7) <u>Good example of a supplier code of conduct from the Responsible Business Alliance (formerly the Electronic Industry Citizenship Coalition)<sup>382</sup></u>
- 8) International Labor Organization Standards on Occupational Safety and Health<sup>383</sup>
- 9) Memorandum of Understanding between the U.S. Department of Labor Occupational Safety and Health Administration (OSHA) and the U.S. Department of Agriculture (USDA) Food Safety and Inspection Service (FSIS)<sup>384</sup>
- 10) OSHA Guidelines for Grocery Stores (Meat & Deli Section)<sup>385</sup>
- 11) OSHA Restaurant Safety<sup>386</sup>
- 12) OSHA Sustainability Connection 387
- 13) Safe Food Alliance What is HACCP?<sup>388</sup>
- 14) ServSafe Food Safety Training Programs<sup>389</sup>
- 15) Society for Human Resource Management (SRHM)<sup>390</sup>
- 16) State Restaurant Association 391
- 17) <u>Sustainability Accounting Standards Board, Consumption II Sector, Standards for Food Retailers and</u> <u>Distributors<sup>392</sup></u>
- 18) Sustainability Accounting Standards Board, Services Sector, Standards for Restaurants<sup>393</sup>
- 19) <u>Tips for Creating Employee Handbooks<sup>394</sup></u>

## CASE STUDIES

- 1) OSHA Case Study #1 Amputation in Meat Grinder<sup>395</sup>
  - This case study is a good example of the importance of workplace safety training, equipment training, safety cleaning equipment, and maintaining discipline at all times.

## REFERENCES

- Baldwin, Cheryl & Wilberforce, Nana & Kapur, Amit. (2011). Restaurant and food service life cycle assessment and development of a sustainability standard. *The International Journal of Life Cycle Assessment*. (Vol. 16. p40-49).
- Ceres. 2018. Feeding Ourselves Thirsty: Key Findings. *Ceres.org.* (2018). Retrieved from https://feedingourselvesthirsty.ceres.org/key-findings.

 $^{386} https://www.osha.gov/dte/grant\_materials/fy11/sh-22303-11/Restaurant\_Safety\_English.pdf$ 

<sup>387</sup>https://www.osha.gov/sustainability/sustainability-connection.html

<sup>388</sup>https://safefoodalliance.com/resources/food-safety-resources/haccp-overview/ <sup>389</sup>https://www.servsafe.com/

<sup>382</sup> https://www.responsiblebusiness.org/media/docs/RBACodeofConduct6.0\_English.pdf

<sup>&</sup>lt;sup>383</sup>https://www.ilo.org/global/standards/subjects-covered-by-international-labour-standards/occupational-safety-and-health/lang--en/index.htm

<sup>&</sup>lt;sup>384</sup>https://www.osha.gov/pls/oshaweb/owadisp.show\_document?p\_id=229&p\_table=MOU

<sup>385</sup> https://www.osha.gov/ergonomics/guidelines/retailgrocery/retailgrocery.html

<sup>&</sup>lt;sup>390</sup>https://www.shrm.org/resourcesandtools/tools-and-samples/policies/pages/cms\_014093.aspx

<sup>&</sup>lt;sup>391</sup>http://www.restaurant.org/About-Us/NRA-Partners/State-Restaurant-Associations

<sup>&</sup>lt;sup>392</sup>http://www.sasb.org/wp-content/uploads/2015/04/CN0401\_Food-Retailers-Distributors\_FINAL.pdf

<sup>&</sup>lt;sup>393</sup>http://www.sasb.org/wp-content/uploads/2014/12/SV0203\_Restaurant\_ProvisionalStandard.pdf

<sup>&</sup>lt;sup>394</sup>http://www.restaurant.org/Manage-My-Restaurant/Workforce-Management/Policy/10-tips-for-creating-employee-handbooks

<sup>&</sup>lt;sup>395</sup>https://www.osha.gov/dte/grant\_materials/fy10/sh-20856-10/Machine\_Guarding\_Case\_Studies.pdf

Di Gregorio, A., and Jansen, L.J.M. (2000). Land Cover Classification System (LCCS): Classification Concepts and User Manual. Retrieved from

http://www.fao.org/docrep/003/x0596e/X0596e01.htm#P32\_1066.

FAO AQUASTAT. 2014. Water Withdrawal. Food and Agriculture Organization of the United Nations. (2014). Retrieved from

http://www.fao.org/nr/water/aquastat/infographics/Infographics\_all\_eng.pdf.

- Johnson, D. L., Ambrose, S. H., Bassett, T. J., Bowen, M. L., Crummey, D. E., Isaacson, J. S., Johnson, D. N., Lamb, P., Saul, M., & Winter-Nelson, A. E. (1997). Meanings of Environmental Terms. *Journal of Environmental. Quality.* (Vol. 26, p581-589).
- Labor Occupational Health Program. 2008. Find it Fix It: Solutions to Workplace Hazards for the Restaurant Industry. UC Berkeley Commission on Health and Safety and Workers' Compensation, & San Francisco Small Business Development Center. (2008). Retrieved from https://www.osha.gov/dte/grant\_materials/fy11/sh-22240-11/RestaurantFinditFixIt.pdf.
- McGraw-Hill Construction. 2010. Water Use in Buildings. *SmartMarket Report: Green BIM.* (2010). Retrieved from

https://www.construction.com/market\_research/freereport/greenbim/MHC\_GreenBIM\_SmartM arket\_Report\_2010.pdf.

- Neff RA, Spiker ML, Truant PL. (2015). *Wasted Food: U.S. Consumers' Reported Awareness, Attitudes, and Behaviors.* PLoS ONE 10(6): e0127881. <u>https://doi.org/10.1371/journal.pone.0127881</u>
- OSHA. 2018. Sustainability in the Workplace. *Occupational Safety and Health Administration (OSHA)*. (2018). Retrieved from <a href="https://www.osha.gov/sustainability/">https://www.osha.gov/sustainability/</a>.
- Packaged Facts. 2017. Animal Welfare: Issues and Opportunities in the Meat, Poultry, and Egg Markets. *Packaged Facts*. (2017). Retrieved from <u>https://www.packagedfacts.com/Animal-Welfare-Meat-10771767/.</u>
- Peet, R. K., & Roberts, D. W. (2013). Vegetation Ecology, Second Edition (pp. 28-70). Oxford, UK: John Wiley & Sons, Ltd.
- Qi D, Roe BE. (2016). Household Food Waste: Multivariate Regression and Principal Components Analyses of Awareness and Attitudes among U.S. Consumers. PLoS ONE 11(7): e0159250. <u>https://doi.org/10.1371/journal.pone.0159250</u>
- Reig, P. (2013). What's the difference between water use and water consumption? *World Resources Institute*. Retrieved from <u>http://www.wri.org/blog/2013/03/what%E2%80%99s-difference-between-water-use-and-water-consumption</u>.
- Retail Industry Leaders Association. 2014. Energy Saving Opportunities and Tactics for Retail. *Retail Industry Leaders Association.* (2014). Retrieved from <u>https://www.rila.org/sustainability/RetailEnergyManagementProgram/Documents/EnergySavingO</u> <u>pportunities+TacticsforRetail.pdf</u>.
- Society for Ecological Restoration International Science & Policy Working Group. 2004. *The SER* International Primer on Ecological Restoration. (2004). Retrieved from <u>https://cdn.ymaws.com/www.ser.org/resource/resmgr/custompages/publications/SER\_Primer/se</u> <u>r\_primer.pdf.</u>
- UNEP WCMC. 2014. Biodiversity A-Z [High Conservation Value Areas]. 2014. Retrieved from http://www.biodiversitya-z.org/content/high-conservation-value-areas-hcva.pdf.
- U.S. EPA. 2012a. ENERGY STAR Guide for Restaurants. *National Service Center for Environmental Publications (NSCEP).* (2012). Retrieved from https://www.energystar.gov/ia/business/small\_business/restaurants\_guide.pdf.

- U.S. EPA. 2012b. Best Management Practices for Commercial and Institutional Facilities. *WaterSense at Work*. (2012). Retrieved from <u>https://www.epa.gov/sites/production/files/2017-</u>02/documents/watersense-at-work\_final\_508c3.pdf.
- U.S. EPA. 2017a. Saving Water in Restaurants. *WaterSense at Work, EPA*. (2017). Retrieved from <u>https://www.epa.gov/sites/production/files/2017-01/documents/ws-commercial-factsheet-restaurants.pdf</u>.
- U.S. EPA. 2017b. Food Recovery Hierarchy. *Sustainable Management of Food, EPA*. (2017). Retrieved from, <u>https://www.epa.gov/sustainable-management-food/food-recovery-hierarchy.</u>
- U.S. EPA. 2017c. United States 2030 Food Loss and Waste Reduction Goals. *Sustainable Management of Food, EPA*. (2017). Retrieved from, <u>https://www.epa.gov/sustainable-management-food/united-states-2030-food-loss-and-waste-reduction-goal.</u>
- U.S. Government Accountability Office. 2014. Supply Concerns Continue, and Uncertainties Complicate Planning. *Government Accountability Office, Freshwater*. (2014). Retrieved from <u>https://www.gao.gov/products/GAO-14-430</u>.
- Union of Concerned Scientists. 2013. Water-Smart Power: Strengthening the US Electricity System in a Warming World. UCS, Energy and Water Use. (2013). Retrieved from <u>https://www.ucsusa.org/clean\_energy/our-energy-choices/energy-and-water-use/water-smart-power.html#.Wlegbv5hhZE.</u>
- USDA ERS. 2018. Irrigation and Water Use. *United States Department of Agriculture*. (2018). Retrieved from <u>https://www.ers.usda.gov/topics/farm-practices-management/irrigation-water-use/</u>.
- World Economic Forum. 2018. The Global Risks Report 2018, 13th Edition. *World Economic Forum*. (2018). Retrieved from <u>http://www3.weforum.org/docs/WEF\_GRR18\_Report.pdf</u>.

# **CRITICAL KEY TERMS**

- 1) **Accreditation**: Formal recognition that a certification body is competent to carry out certification.
- 2) Animal productivity: This can be in the form of reproductive productivity, weight gain, muscle mass gain, etc., depending on the animal and stage of life.
- 3) Animal welfare or care and handling policy: A statement or statements describing the company's values and principles related to beef cattle management through the supply chain (e.g., antimicrobial stewardship).
- 4) **Aspirational goal**: Broad and directionally specific goal (e.g., increase or decrease) but without a specific end point or timeline.
- 5) Audit: A systematic, independent, and documented process for obtaining records, statements of fact, or other relevant information and evaluating it objectively to determine the extent to which specific requirements are filled. (ISO 14001:2015)
- 6) **Balanced diet:** A diet that provides the correct amount of energy and macro and micro nutrients for the given phase of the animal's life.
- 7) **Beef quality assurance program (BQA):** A national program that provides education in proper management techniques throughout the beef industry. Its focus is to encourage techniques to raise consumer confidence and inspire a commitment to quality. More info at www.bqa.org.
- 8) **Beef supply/value chain:** The group of participants that make up the value chain, including but not limited to the cow-calf producer, auction market, stocker, feedyard, packer/processor, retailer/food service, and end consumer.
- 9) **Benchmark**: Level or state of a metric representing performance of an indicator at a specific place or point in time, usually for comparative purposes.

- 10) **Bulls:** Intact male cattle used for breeding purposes.
- 11) **Calves:** Young cattle, under one year old.
- 12) **Calving season:** Time period of the year when cows are calving (birthing).
- 13) **Carbon sequestration:** A natural or artificial process by which carbon is removed from the atmosphere and held in long-term storage in solid or liquid form; typically referring to the storage of carbon that has the immediate potential of becoming carbon dioxide gas.
- 14) **Cattle maintenance requirements:** Nutrients required for the animal to keep alive and moving.
- 15) **Certification (verification) label**: Label or symbol verifying compliance with a specific standard. Use of the label is controlled by the standard setting or certification body. The label is a communication between the seller/buyer and also with the end consumer. For the label to be effective, it must be backed up by a good certification, free of conflict of interest, transparent, and have opportunities for public comment.
- 16) **Certification bodies/certifiers**: The organization performing the certification is called a certification body or certifier. The certifier might do the actual inspection or contract this out.
- 17) **Certification**: Procedure that gives written assurance that a product, process, or service conforms to certain standards. Certification can be seen as a form of assurance. The certification decision is the granting of a "certificate" and is based on an inspection and inspection report.
- 18) **CO2e:** Carbon dioxide equivalent; a metric that expresses the impact of a greenhouse gas in terms of the amount of carbon dioxide (CO2) that has the same global warming potential.
- 19) **Code of conduct:** A set of rules about how to behave and do business with other people.
- 20) **Concentrate feeds:** Typically grains (e.g., corn) or byproducts (e.g., distillers dried grains), concentrate feeds are typically higher in energy than forages.
- 21) **Continual improvement**: Recurring activity to enhance performance. (ISO 14001:2015)
- 22) **Conversion:** Transformation of land cover from one dominated by natural or semi-natural vegetation to an intensive agricultural, urban, or other human-dominated type. Habitat, spontaneous natural processes, and ecosystem service values are typically degraded or lost through conversion and may be difficult, costly, or infeasible to fully restore. Includes deforestation, in which tree-dominated ecosystems are converted to lower-stature vegetation, including livestock or row crop agriculture or urban land uses. (SER 2004, FAO 2000, Peet and Roberts 2013)
- 23) **Cows:** Female cattle that have had one or more calves.
- 24) **Credence Attributes**: Credence attributes of products are unobservable through search or experience. Some consumers are willing to pay a premium for their provision, and in addition, citizens can apply social pressure on firms to supply credence attributes (such as environmental impact and animal welfare).
- 25) **Credible:** Ultimately, it is up to each company to determine the level of credibility they are seeking in expertise. Third-party organizations without conflicts of interest or financial investment in the beef industry tend to increase credibility of assessments.
- 26) **Deforestation risk:** The risk that conversion, including deforestation, could be happening in a company's supply chain. This type of risk should be differentiated from the brand risk associated with not taking clear steps to avoid deforestation or land conversion in one's supply chain.
- 27) **Deforestation:** Land cover conversion from tree-dominated ecosystems to lower-stature vegetation, including livestock or row crop agriculture or urban land uses. Also see **Conversion**.
- 28) **Distribute:** The process of supplying beef to stores and other businesses that sell to consumers.
- 29) **Efficiency Indicators**: Measurements of the parameters of concern with respect to units of production (average daily gain, feed conversion, time).
- 30) **Efficiency**: The amount of output produced for a unit of input (e.g., kilogram of beef per liter of water).

- 31) **Enteric methane emissions:** Enteric fermentation is a natural part of the digestive process of ruminants where microbes decompose and ferment food present in the digestive tract or rumen. Enteric methane is one byproduct of this process and is expelled by the animal primarily through eructation (burping).
- 32) **Enterprise**: Organization or affiliation for a common economic purpose, such as farm, ranch, auction market, stocker operation, feedyard, packer, processor, retail or food service company.
- 33) **Farming operation**: Discrete enterprise that grows plants and/or animals for economic value for human utilization as food, feed, fuel, fiber, or other social, cultural, or economic purposes.
- 34) **Fed cattle:** Cattle (typically steers and heifers) that have been fed in a feedyard and are ready to go to the beef packing plant.
- 35) **Feed additives:** A food supplement for farm animals that supports animal performance and health and can include vitamins, amino acids, fatty acids, and/or minerals.
- 36) **Feed bunks:** The area in a feedyard pen where the feed is put for the animals to consume.
- 37) **Feedlot performance measures:** These include measurements such as average daily gain of cattle, feed/gain conversion, death loss, and cost of gain.
- 38) **Feedstuffs shrink and storage loss:** Between the time that feed is harvested in the field to when it reaches the feed bunk at the feedyard, there is feedstuff loss and shrink for a variety of reasons, including loss during mix and transportation/storage, loss due to wind and weather, and loss due to pests, including birds and rodents.
- 39) **Feed-to-gain ratios:** The amount (weight) of feed it takes for an animal to gain one pound.
- 40) **Final carcass weight:** The weight of the carcass of the animal after it has gone through a processing plant and hide, and internal organs have been removed.
- 41) **Finished product:** This can range from full primal cuts of beef to individually packaged consumer ready cuts of beef, depending on the facility and operation type.
- 42) **Flush system:** Typically, a system that uses water to flush animal excrement out of the barn/pens/alleyways into a lagoon/collection pit/retention pond.
- 43) **Food waste targets:** A quantifiable goal to reduce food waste compared to a baseline year (e.g., reduce food waste 20% since 2015; preferred option) or as a proportion of overall food or waste volumes (e.g., divert 50% of food waste from landfill year-on-year). If the waste assessment shows beef is wasted, efforts to reduce beef waste should be included in the target.
- 44) **Food waste:** Organic waste that can either be prevented, recovered (donated for human consumption), or recycled (repurposed for animal feed, converted to energy, or composted) to improve efficiency of resources.
- 45) **Forage production:** The farming/production of grass and/or hay.
- 46) **Forage/pasture utilization rates:** Percentage of forage consumed in a determined area.
- 47) **Forage:** Bulky food, such as grass or hay, for livestock.
- 48) **Front-line employees:** Typically, these are employees who are on the processing lines, handling the beef and breaking it down from large cuts to desired cuts, depending on the facility.
- 49) **Global warming potential (GWP):** Factor describing the radiative forcing impact of one mass-based unit of a given greenhouse gas relative to an equivalent unit of carbon dioxide over a given period of time.
- 50) **Grazing unit:** Area of land used for grazing.
- 51) **Greenfield:** Area that has not been graded, compacted, cleared, or disturbed and that supports (or could support) open space, habitat, or natural hydrology. Areas that have been graded, compacted, cleared, previously developed, or disturbed in any way do not qualify as greenfield. (Source: USGBC https://www.usgbc.org/glossary/)

- 52) **Greenhouse gas (GHG):** Gases that contribute to the greenhouse effect by absorbing infrared radiation in the atmosphere, e.g., carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), ozone, and chlorofluorocarbons.
- 53) **Greenhouse gas emissions**: Release to the atmosphere of any gas that creates or contributes to creation of the greenhouse effect in Earth's atmosphere, particularly carbon dioxide (CO2), methane (CH4) and nitrous oxide (N2O).
- 54) **Greenhouse gas sink:** Physical unit or process that removes GHGs from the atmosphere.
- 55) **Greenhouse gas source:** Physical unit or process that releases a GHG into the atmosphere.
- 56) **Growth promoting technologies:** Growth promotants are among the tools used by feedlots and other producers to raise more beef, more rapidly, using less feed, while maintaining high standards of animal health, carcass quality, and food safety. Growth promotants include ionophores, growth implants, and beta-agonists.
- 57) **Heifers:** Young female cattle who have not yet had their first calf.
- 58) Herd health: Overall biological health of the herd (group of cattle).
- 59) **High conservation value:** Biological, ecological, social, or cultural values considered outstandingly significant at the national, regional, or global level. May be measured by, e.g., degree of species (especially native species) richness or other metric of species, community, or landscape-level diversity, and/or quantity critical ecosystem services or nature-derived cultural values. (UNEP-WCMC 2014). High conservation value land may also include intact or native landscapes.
- 60) **Holding ponds:** Area built to collect runoff of water and excrement from animal pens when the pens are flushed or during rainy periods.
- 61) **Impact area**: Broad category of social or environmental results to track.
- 62) **Impact indicators**: Measurements of outcomes or impacts that result directly or indirectly from activities and processes.
- 63) **Impact(s)**: Positive and negative outcome(s) wholly or partially resulting from an organization's specific practice or production system. (ISO 14001:2015)
- 64) Indicators: Quantitative or qualitative factor or variable that provides a measurable representation of outcomes of activities to reflect the changes connected to a standards system, or to help assess the performance of an organization. (ISEAL 2015) Indicators should be specific, measurable, achievable, relevant, and time-bound. Indicators should be outcomes-based, science-driven, technology-neutral, and transparent. The relationship between the indicator and the outcome of concern should be described, and the metrics should represent the outcome as closely as possible.
- 65) **Intact habitat:** Intact habitat, as defined by the Plowprint analysis, includes those lands that were not in annual crops as of 2008 (in the U.S.) or 2009 (Canada), have not been converted to annual crops between 2008/9 and 2016 (or the most recent year of data), and are also not classified as developed, barren, or open water as of 2011 (the most recent data available for these categories).
- 66) Ionophores: Feed additives used in cattle diets to increase feed efficiency and body weight gain. These are compounds that alter rumen fermentation patterns. Ionophores can be fed to any class of cattle and can be used in any sector of the beef cattle industry. Similar to many other feed additives, ionophores are fed in very small amounts and supplied via another feedstuff as carrier for intake. Ionophores decrease incidence of coccidiosis, bloat, and acidosis in cattle.
- 67) **Livestock and wildlife carrying capacity:** The number of animal units that can be grazed for a specific period of time.
- 68) **Marketing:** The sale of a fed animal (typically steer or heifer) from the feedyard to the packer.
- 69) **Marketplace:** In an economic sense, the marketplace of buyers and sellers of cattle and beef, across the beef value chain.
- 70) **Metric**: Means of measure; the specific quantification of an indicator; how indicators are defined.

- 71) **Net deforestation:** The difference between the clearance or conversion of forests in one area and the replanting of forests in another area.
- 72) Non-ambulatory animal: Animals that are unable to rise, stand, or walk without assistance.
- 73) **North American Meat Institute (NAMI):** A national trade association representing companies that process 95% of red meat and 70% of turkey in the U.S., as well as their suppliers.
- 74) **Operational goal**: Results to be achieved that define rate and scope of implementation of practices and other activities to achieve tactical goals ("results to be achieved" from ISO 14001:2015).
- 75) **Outcomes**: Measurable impact or changes in indicators that occur as a result of an action, including a practice, strategy, or policy.
- 76) **Own operations:** Refers to facilities in direct control (franchised businesses should leverage company-owned facilities at a minimum).
- 77) **Package:** Steps involved from the large primal cuts of beef down to individually packaged cuts of beef.
- 78) **Pasture:** Land covered with grass and other low plants suitable for livestock grazing.
- 79) **Performance:** Tracking and reporting of progress around the set target.
- 80) **Process standards**: Criteria for the way products are made.
- 81) **Process:** Steps involved from the animal to the beef meat.
- 82) **Producer/rancher:** The individual(s) who own and operate the farm and/or ranch.
- 83) **Product standards**: Specifications and criteria for the characteristics of products.
- 84) **Publicly available datasets**: Data sets either collected, vetted, or distributed by public agencies, available for nominal to no fee, for public use. Examples include data collected, vetted, and distributed by the U.S. Environmental Protection Agency, U.S. Geologic Survey, U.S. Department of Agriculture (specifically the National Agricultural Statistics Service and Economic Research Service data) and others.
- 85) **Retention pond**: Area built to collect runoff of water and excrement from the animal pens, which occurs if the pens are flushed or during rainy periods.
- 86) **Riparian areas:** Interface between land and a river or stream that serves as a natural water treatment facility for the watersheds.
- 87) **Scope 1:** Direct emissions from onsite combustion and mobile sources.
- 88) **Scope 2:** Indirect emissions from purchased electricity and steam.
- 89) **Scope 3:** Sometimes called "optional emissions" that include product transport, employee business travel, and employee commuting.
- 90) **ServSafe:** Nationally accredited food safety certifications from the National Restaurant Association.
- 91) **Stakeholder**: Person or organization that can affect or be affected by or perceive him/herself or itself to be affected by a decision or activity. (ISO 14001:2015)
- 92) **Standard operating procedures (SOPs):** A set of step-by-step instructions to help workers carry out routine operations. SOPs aim to achieve efficiency, quality output, and uniformity of performance, while reducing miscommunication and failure to comply with industry regulations.
- 93) **Standards**: As defined by ISO, documented agreements containing technical specifications or other precise criteria to be used consistently as rules, guidelines, or definitions to ensure materials, products, processes, and services are fit for their purpose.
- 94) Stewardship: The job of supervising or taking care of something.
- 95) **Stockmanship:** The knowledgeable and skillful care, management, and handling of livestock in a safe, efficient, effective, and low-stress manner, which denotes a low-stress, integrated, comprehensive, holistic approach to livestock handling.
- 96) **Strategic goal**: Numerically specific result to be achieved regarding improvement of a specific outcome. Includes a timeline for achieving the numeric improvement.

- 97) **Sustainability strategy**: Process for improved decision-making that considers multiple facets of risk and impact across economic, community, and environmental dimensions.
- 98) **Tactical goal**: Numerically specific result to be achieved within an enterprise for achieving strategic goals. Includes a timeline and range of options for achieving the desired numeric improvement.
- 99) **Third-party verification**: Assurance activity that is performed by an independent person or body. (ISEAL 2015) Independence can be demonstrated by the freedom from responsibility for the activity being audited or freedom from bias and conflict of interest. (ISO 14001:2015)
- 100) **Verification**: A confirmation by examination and provision of objective evidence that the requirements have been met (Observation, Interviews, Documented Processes and Procedures, Records). The process by which an entity is evaluated or assessed against a standard or set of criteria. It is also used as a method to "step" systems into a certified method.
- 101) Veterinarian Feed Directive (VFD): Outlines the process for authorizing use of animal drugs intended for use in or on animal feed that require the supervision of a licensed veterinarian and provides veterinarians in all states with a framework for authorizing the use of medically important antimicrobials in feed when needed for specific animal health purposes.
- 102) **Waste**: Product that must be disposed of that if not otherwise diverted, reused, recycled, etc. would end up in landfill.
- 103) Water balance: An audit that will allow the company to track the input and output of water used throughout the facility.
- 104) **Water quality:** The condition or state of water relative to the requirements of one or more biotic species and/or to any human need or purpose. (Johnson et al. 1996)
- 105) Water risk: The probability and severity of an entity experiencing a deleterious water-related event. (CEO Water Mandate)
- 106) Water use: Describes the total amount of water withdrawn from its source to be used. Measures of water usage help evaluate the level of demand from industrial, agricultural, and domestic users.
- 107) **Weaning:** The process of separating a calf from its mother by transitioning it from a diet of the cow's milk to a forage-based diet at about seven to eight months old.