RIGHT WAY. RIGHT TIME.

A Guide to Cull Dairy Cattle Management

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CattleFax The Deciding Factor

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Two phrases that describe all of agriculture and especially the dairy industry are: "We are continuously improving, and when we know better, we do better." The “RIGHT WAY. RIGHT TIME.” document shows us as a dairy industry some areas where we have the opportunity to increase the value of our cull animals before they are leaving our farms. As dairy producers it is hard to hear the words “milk is a contaminant," but milk that leaks from an udder onto a carcass is a contaminant, resulting in trimming of the carcass and slowing the production line. As we take advantage of timely removal of mature dairy animals to make room for more profitable younger animals, we are faced with higher producing culls (full udders of milk). In order to avoid deductions at the sale barn, we will need to consider having protocols in place to let the udder "dry up" before going to the sale barn, and in that way, avoid deductions for full udders.

Marketing our mature cows for beef is another revenue source that is very important for the dairy industry to maintain and to improve the quality of the animals we send to sale barns. Having best management protocols in place with facilities available to hold mature cows to feed and increase body condition scores is another possible revenue source. These improved body condition score animals are also easier to transport to packing plants with less stress. From the 2022 National Beef Quality Audit, we in the dairy industry have been shown some areas that we could expand our revenue stream by incorporating some strategic culling and marketing protocols.

Karen Jordan, DVM
Brush Creek Swiss Farms

Glossary

Animal Welfare/Well-being
The physical and mental state of an animal in relation to the conditions in which it lives and dies.

Body Condition Score (BCS)
A measure to assess the amount of body fat coverage or energy reserve in the cow; based on a five-point scale for adult dairy cattle or calves. Can be used as an effective management tool as body condition influences the productivity, reproduction, health, and longevity of dairy cattle.

Compromised Animal
An animal that is weakened, impaired, or vulnerable due to injury, stress, disease, or loss of condition. Will have reduced capacity to withstand typical handling, transportation practices, or weather.

Culling
The departure of cows or calves from the herd because of sale, slaughter, salvage, or death.

Custom Exempt Processor
A processor that can operate without federal and/or state inspection because they process meat for the exclusive use by the owner. This can be an option for emergency slaughter of compromised animals.

Euthanasia
The intentional ending of an animal's life by an acceptable method that minimizes or eliminates pain and distress.

Fitness for Transport
The animal's ability to withstand transportation, including length of trip, weather conditions, stocking density, and other factors, without compromising welfare.

Foreign Object
Non-animal objects, such as metal, plastic, rubber, glass, wood, steel, or lead shot that can be found in the body or tissues where it does not belong.

Mobility/Locomotion
Describes an animal's ability to walk based on a 3, 4, or 5-point scale. It can be an effective management tool to identify lameness and evaluate fitness for transport.

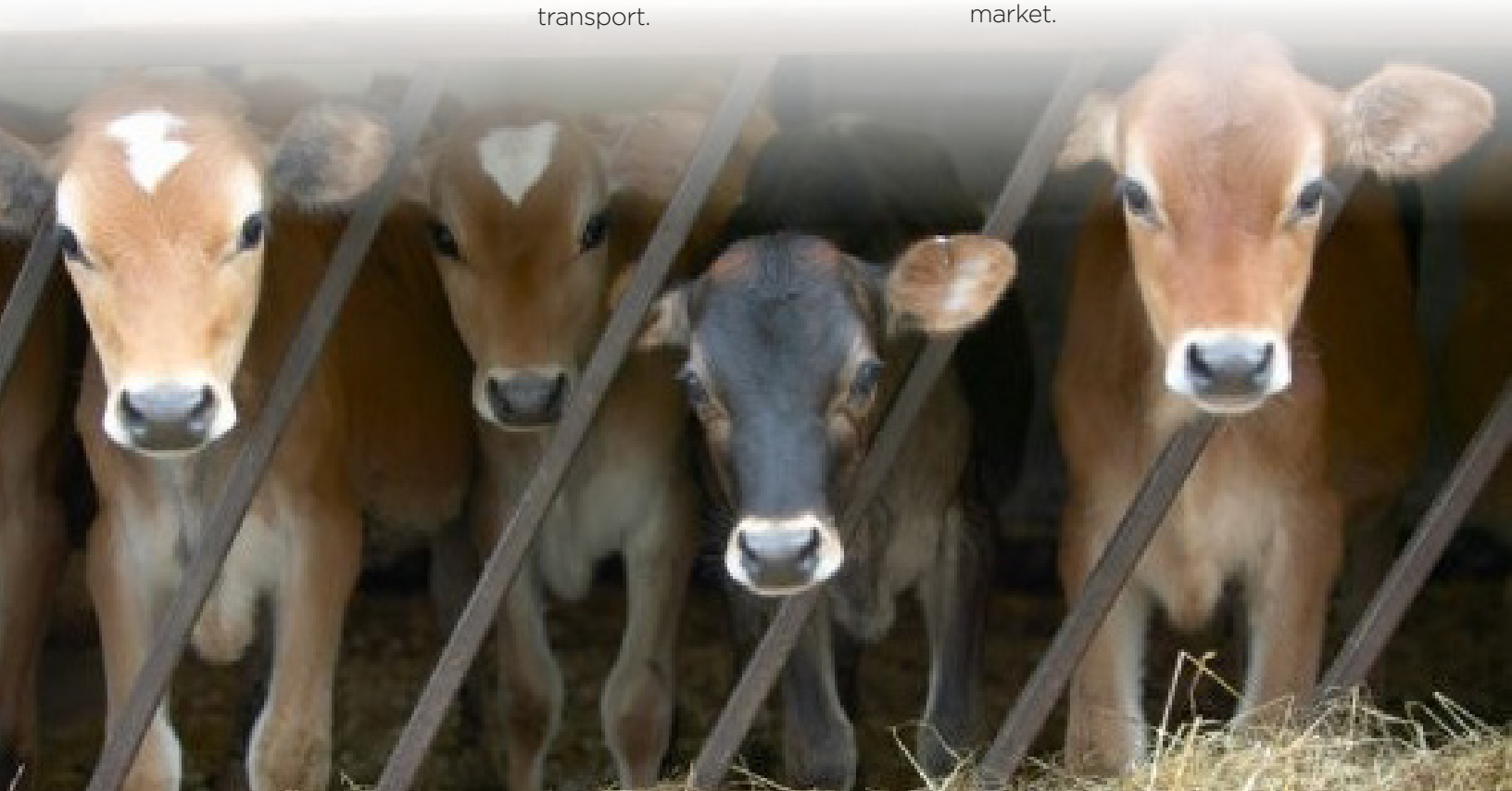
Non-Ambulatory/Downer
A disabled or compromised animal that is unable to rise, stand, and/or walk without assistance due to injury, illness, weakness, and/or pain. These animals are not eligible for slaughter at a facility.

Non-Terminal Market
A market where animals are bought and sold, for example, a sale yard or auction market; not a slaughter facility.

Open Cows
Non-pregnant cows.

Sick Pen or Hospital
A pen, paddock or other space dedicated to housing compromised animals separate from the general animal population. This space should provide adequate shelter from the elements and protection from predators. Ample bedding should be supplied for comfort and substrate added to provide proper footing. While in this area, the animal should have full access to quality feed and water.

Terminal Market
A slaughter facility or packing plant; not a sale yard or auction market.



Introduction

For dairy farmers and cattle ranchers across the country, managing cull cattle is an important component of overall herd management. Factors such as fitness for transport, milk production, age, health issues like mastitis or lameness, stage of lactation, reproduction, or market economics can influence these management decisions. Incorporating and honing culling and transportation decision guidelines into an operation's best management practices benefits both cow welfare as well as the producer's bottom line. Animal well-being must be considered in every decision made throughout the animal's life.

Even though cull animals are often viewed as a loss, with effective planning, these animals can be a significant source of revenue and should not be overlooked. In essence, cull cattle are market cattle. According to the 2022 National Beef Quality Audit (NBQA), when dairy or beef cows and bulls can no longer be used for their original purpose, they are still valuable. The market cow and bull sector repurposes these animals into different products, giving them a new function and adding extra value. When it comes to product fabrication, market cows and bulls (dairy or beef) provide value through ground beef production.

This document addresses key areas of opportunity for effective cull cattle management, provides strategies for making timely culling decisions and improving welfare, and is designed to help producers examine the opportunity to capture more value.

Keeping Cull Cattle Healthy

Culling management starts with the foundational health of the herd. It is inevitable that cows will reach the end of milk production. However, if the animal's health is maintained throughout its lifetime, the cow will have better welfare and financial outcome when it is time to be culled from the herd.

Injections in the neck prevent costly damage to economically important beef cuts.

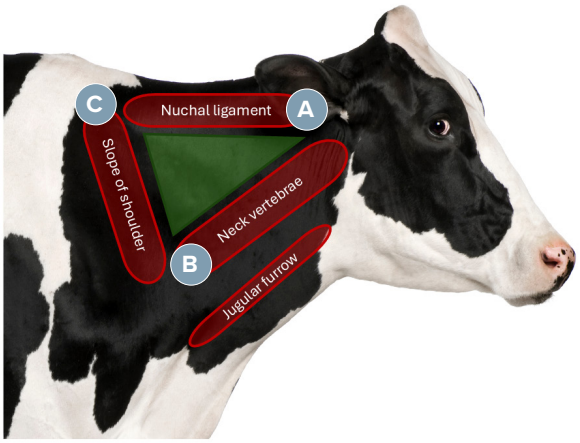
DO NOT INJECT IN HIP.

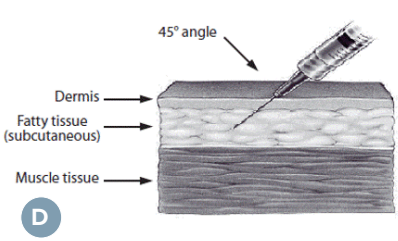
BQA Injection Site Triangle

- (A) Upper border is below nuchal ligament (2" below topline)
- (B) Lower border is above neck vertebrae
- (C) In front of the slope of the shoulder

Routes of Administration

- (D) Subcutaneous (SQ) – Under the skin; given at 35-45° angle to neck
- (E) Intramuscular (IM) – In the muscle; given perpendicular to muscle; 90° to neck (Figure 4)
- Intravenous (IV) – In the vein
- Intramammary (IMM) – In the mammary gland and does not use a needle
- Base of ear (BOE) – Under the skin
- Intranasal (IN) – In the nose (without a needle)
- Topical – On skin, transdermal





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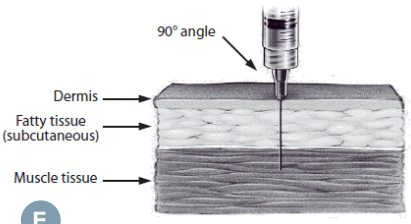
Subcutaneous (SQ) Injection with Needle Angle at 45°



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Intramuscular (IM) Injection with Needle Angle at 90°

Illustrations courtesy of Colorado BQA Program.

The following are a few principles that the Beef Quality Assurance (BQA) and the National Dairy Farmers Assuring Responsible Management (FARM) programs recommend to assist with keeping cows healthy:

Veterinarian-Client-Patient Relationship (VCPR) – A VCPR is critical to both animal health and herd profitability. Establishing a working relationship with a veterinarian allows them to diagnose and treat animals, provide guidance on treatment and vaccination protocols, prescribe medications, advise on antimicrobial stewardship, and issue Certificates of Veterinary Inspection (CVIs) or health certificates. Other aspects of herd health like proactive culling decisions can be included. Remember, all injectable antibiotics for livestock require a prescription from a licensed veterinarian under a valid VCPR.

Animal Health Products – There are many animal health products on the market that afford cattle producers the ability to prevent against disease (vaccines or dewormers) and treat harmful diseases and pathogens like viruses, bacteria, or parasites that infect cattle. Animal health products MUST be administered specifically as the label indicates – including route of administration, dosage, frequency, withdrawal period, and even storage requirements. Remember, animal health products are not 'management in a bottle,' but a tool that can help meet herd health goals.

Injection Location – All injectable animal health products must be given in the neck within the injection triangle, unless otherwise directed by the label. Ensure facilities allow for safe product administration. The injection triangle provides ample room for both intramuscular and subcutaneous injections, without the risk of damaging high value meat cuts. All animals could become part of the beef supply, so it is important to consider where and how we give injections to maintain meat quality. Remember, even if synchronizing estrus for an AI protocol, injections still need to be given in the neck.

Proper Drying-Off Protocol – Proper drying-off protocols for dairy cattle are essential to ensure cattle health and productivity in the next lactation or to be culled from the herd. The process begins by identifying cows that need to be dried off and marking them clearly. Hygiene is crucial, so workers should wear clean gloves and disinfect teats thoroughly before administering any treatments. Using intramammary antibiotics may help prevent infections during the dry period, though are not always necessary. Additionally, maintaining a dry period of 45 to 60 days allows the cow's udder to undergo necessary anatomical and physiological changes, reducing the risk of mastitis and ensuring optimal milk production in the next cycle.

Nutrition – Proper nutritional management is essential for maintaining the health, productivity, and efficiency of dairy cattle, with a focus on balanced intake of energy, protein, vitamins, minerals, and water. Cattle must have continuous access to clean water and quality feed, as interruptions longer than 24 hours can negatively impact performance and welfare. Nutritional needs vary based on breed, age, sex, and production stage, so diets should be tailored accordingly, using tools like Body Condition Scoring to guide adjustments. Energy, primarily measured as total digestible nutrients (TDN), is the most critical nutrient, while protein requirements must balance rumen degradable and undegradable sources, especially during growth or lactation. Supplementation of microminerals and vitamins is vital, particularly when cattle graze on dormant pastures or consume stored forages.

Record Keeping – It is important to maintain accurate, thorough, and timely production records. Records have many uses that help producers manage herd health and nutrition programs, control production costs, and help make well-informed decisions about marketing cattle. Remember, you can't manage what you don't measure. Records should include date of treatment, treated animal identification, name of the treatment used, disease/condition being treated, dosage administered, route of administration, duration of the treatment, and specified withdrawal/withhold times for milk and meat to ensure food safety. Records should be stored for a minimum of two years per FDA recommendations.

Withdrawal Period – This is the amount of time that must pass from the last time an animal was given an animal health product to the date the animal can be shipped, or milk can be sold, It is the producer's obligation to keep good records and abide by withdrawal periods to eliminate the risk of drug residues in beef carcasses and milk. Remember, all animal health products, including antibiotics, vaccines, and dewormers, have withdrawal periods. For instance, some topical or transdermal dewormers like pour-ons have withdrawal periods of 45 days or longer. It is important to ensure all animals have cleared withdrawal times on any pharmaceutical that they may have received prior to shipping them.

Drug Residues - At all federally inspected slaughter establishments, USDA Food Safety & Inspection Service (FSIS) will test incoming cattle for the presence of drug residues as part of the National Residue Program. The two types of testing that FSIS conducts consist of directed and inspector-generated sampling. Directed

sampling is a random sampling of a certain group of animals (e.g., beef cows, dairy cows, etc.), while inspector-generated sampling is at the discretion of the FSIS public health veterinarian and targets animals that are displaying certain disease states where treatment is more likely (e.g., pneumonia).

If ANY animals test positive twice within a year, the producer will be added to the USDA's Residue Repeat Violator List. Once on this list, the producer's incoming animals will be more heavily scrutinized and targeted for additional residue testing at slaughter. Residue violators will also be subject to investigations by the U.S. Food and Drug Administration (FDA). As the consequences are serious, it is important that producers establish a responsible and robust treatment program for their operations.

It is recommended that all producers work closely with their veterinarians to establish proper treatment protocols. Ensure that all employees administering treatments on-farm are knowledgeable about these protocols and understand the importance of following them correctly. Proper documentation is important, whether it be handwritten or computer software records. When choosing an antibiotic, make sure it is appropriate for the type of condition and animal being treated. Please note, there are a variety of antibiotics that are not approved for dairy cattle older than 20 months of age. Giving these antibiotics to adult dairy cattle is illegal. When giving the treatment, ensure that label directions are followed, unless directed by the veterinarian to do otherwise. Identify the correct weight of the animal, follow the right dose, and give in the right location. Remember to follow the BQA guidelines on proper treatment administration.

It is very important to follow the withdrawal times on the label before sending to slaughter. Please note that sick animals will often have impaired metabolism and may not clear the drug compounds according to the normal withdrawal hold. Therefore, it may be necessary to hold these animals longer than what the label says. If unsure of when it is safe to ship a previously treated animal for slaughter, consult with the veterinarian.

Animal Evaluation

Dairy cows are handled multiple times a day and therefore should be evaluated often. In addition to milk production and pregnancy status, important traits identify if a cow or calf is in good health and able to manage upcoming metabolic or environmental challenges. Often, a cow's teeth, body condition, feet and legs, udder, milk production, and other potential abnormalities are evaluated to help farmers make well-informed marketing decisions.

Keep in mind that most of these criteria are analyzed once the cow is in the milking parlor or during feeding for youngstock. Farmers, managers and employees should develop the habit of assessing cattle fitness every time they are handled or observed and making proactive decisions to ensure early treatment or early culling when in both cases outcomes will be better.

Animal Handling

Appropriate animal handling is critical to reducing stress, maintaining health, and preventing human or animal injury and carcass bruising. Handling and milking facilities should be inspected frequently to make sure equipment is working properly and that there are no protrusions that can potentially be harmful to the animals causing hide or tissue damage. Handling and transportation are stressful events for cattle of all ages. By utilizing natural animal behaviors and considering individual temperaments, producers can mitigate stress and reduce incidences of injury. Always avoid rough handling of the animals as this will increase the chances of injuries to both people and animals. All cattle handlers are encouraged to study cattle behavior to improve movement.

Cattle Natural Behaviors:

- They are prey animals and like to see who and what is around them.
- They have panoramic vision, meaning cattle can see 300° and have a blind spot directly behind them.
- They are sensitive to loud sudden noises.
- They are herd animals and don't like to be isolated.
- They want to return to the last safe location.

The single best way to enhance animal welfare in the cattle industry is to improve how cattle are handled. Proper employee training is critical to both human and animal safety.

Transportation

Transportation for cattle and calves is a stressful event and can lead to negative welfare and meat quality outcomes if not managed properly. Take appropriate steps to make the last leg of her journey the best one. Key welfare factors should be considered before, during, and after the transportation process, including fitness for transport, overcrowding, long travel distances, access to milk or milk replacer/food/water/rest, ambient temperatures, driver experience, and others.

Regarding stocking density, since 2016, there has been an increase in the amount of trailer loads that allotted sufficient space as outlined in the Animal Handling Guidelines, developed by The Meat Institute. In addition, there were no cattle in the most recent NBQA that were hauled longer than 24 hours on the final trip segment. Of truck drivers surveyed, 63.6% reported to be BQA certified. Increased transporter training and education is one way to improve how animals coming to slaughter are being handled properly, thus reducing the risks of stress, bruising, downers, and negative public perception.

Bruise damage is still a leading cause of trimming and finding ways to reduce bruising should be a priority for the industry. In cull dairy cattle, improving body condition scores, adapting handling facilities and trailers to taller cattle, and improved worker handling training can lessen bruising. Fewer instances of bruising allow for less trim loss and therefore increase the value of market cow and bull carcasses.

Understanding how temperatures, wind speed, humidity, and storms affect cattle and calves during transportation is important for haulers. For more information on the temperature humidity index (THI), see the BQA National Manual. If possible, avoid handling cattle when the risk of heat and/or humidity stress is high. Handling cattle in a calm manner should reduce stress.

In addition to animal welfare, employee and handler safety should also be considered. Most human injuries occur during the loading and unloading process, therefore training is important.

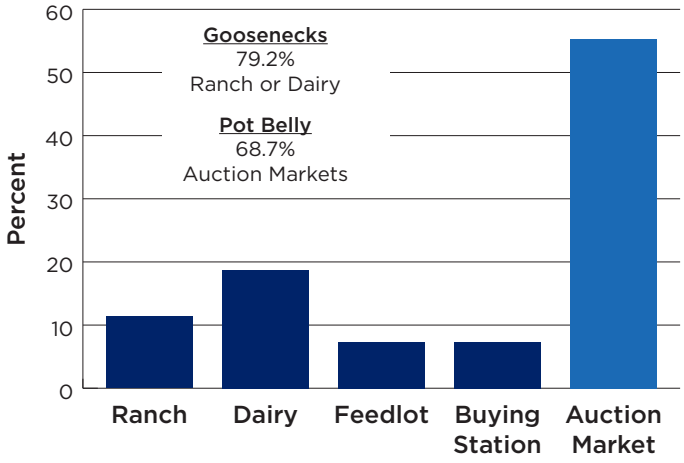
As recommended by the American Association of Bovine Practitioners: Calves shipped to calf-raising facilities should be healthy, individually identified and fit for transport. Personnel determining the fitness of individual calves for transport should be trained to assess calf health and welfare including dehydration, lameness, body condition score, disease recognition and other factors. All calves should be dry, well hydrated, free from apparent illness and injury, and fed a meal and able to stand without assistance. Non-replacement calves must receive colostrum at birth.

Visit **www.bqa.org** for information about Beef Quality Assurance Transportation training and certification resources.

Mean values for time and distance traveled, number of cattle in the load, trailer dimensions and the subsequent area allotted per head for dairy loads based on the 2022 NBQA.

Transportation Characteristics	*n*	Mean	Std. Dev.	Min.	Max.
Time Traveled, Hours	46	3.8	4.29	0.1	15.5
Distance Traveled, (Miles)	39	188.2	167.07	2.0	549.9
No. of Cattle in Load	49	22.5	11.83	1	45
No. of Comp. Used	45	3.2	1.60	1	6
Trailer Dim. (Sq ft)	34	141.65	141.65	3.2	451.0
Area Alloted Per Head	34	21.5	15.39	0.0	63.5

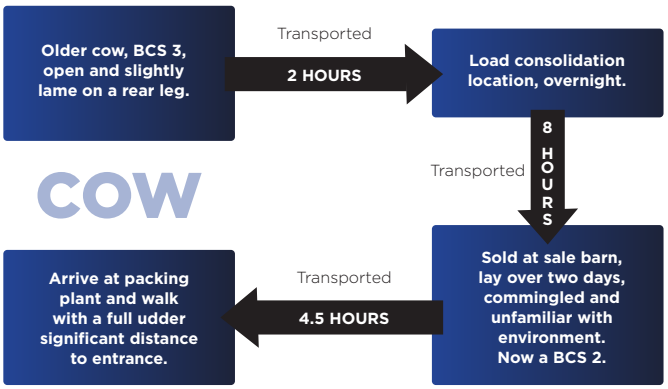
Location of Origin



Evaluating Cull Cattle: Timely Marketing

A variety of qualities are used to determine if cull cattle are ready to ship, and ensuring animal welfare is a top priority. Defined by BQA and FARM as “fitness for transport,” body condition score, soundness/mobility, full udders, and disease/health status should be considered before sending cattle to auction markets, slaughter facilities, or other farms. While these decisions can be difficult, proactive decision making and being realistic about the animal’s potential for recovery is key. The following are some main concerns and issues when marketing cull cattle, however, the list is not all inclusive.

Transportation Impact Examples

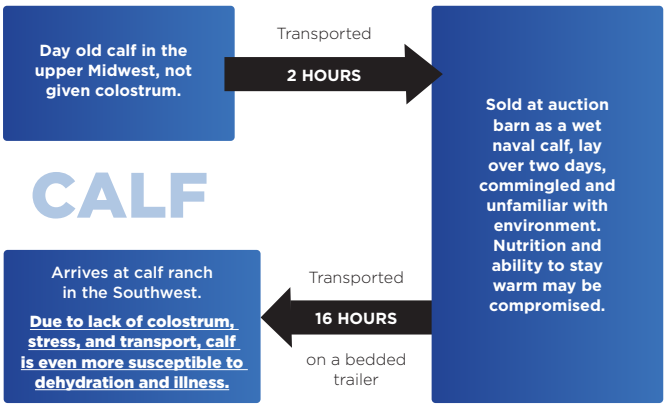


Total Travel Time Over Five Days: 15 hours

These are the considerations for the journey this cow is making:

- Will she have enough energy and strength to make the trip?
- What will the weather be like during the trip? Too hot or too cold?
- Will she withstand that much time on the truck plus multiple unloading and loading events?
- Will she make it through the auction market?
- Will increased stress worsen any existing injuries or health problems?
- Consider loading density, how much room will she have on the trailer?
- What is the feed and water availability to maintain energy before and during transport?
- Should you consider taking her to a closer local packing plant?
- After arriving at the final destination is she capable of standing there for a period of time, pass pre-slaughter inspection, and then walk the distance from the holding pen to the plant?
- Remember that these animals are going into the food chain, so would you eat the meat from this cow?

Am I making the right decision for the cow?



Total Travel Time Over First Days of Life: 18 hours

These are the considerations for the journey this calf is making:

- Did this calf receive colostrum if less than a day old? If older than a day old, did this calf receive a meal before transport?
- Did this calf receive any treatment (naval dip)?
- How is this calf being transported (trailer bedding)?
- Can the calf withstand temperature changes on the truck?
- What is the destination for this calf?

Am I making the right decision for the calf?

Fitness For Transport

Evaluating fitness for transport is an important responsibility that all cattle caretakers should prioritize. This can be subjective depending on the individual situation and consulting their herd veterinarian is recommended. The purpose of evaluating fitness for transport is to make timely decisions regarding an animal's ability to withstand the rigors of transport, including distance, temperature, and stocking density for the entire journey – not just the singular leg to the animal's next destination. Transportation is a stressful event for cattle and prioritizing fitness for transport is a way to remove some of that stress and be intentional about the next step of the animal's life. For instance, extreme temperatures can increase an animal's risk of deteriorating health on the trip. It's important to always consider that cull cattle are going beyond the farm gate or auction market and may be in transit for several days.

What to Consider:

- Market earlier in life so cull cattle are in better shape to withstand the length of the trip.
- Be realistic about the animal's chance of recovery.
- Evaluate the animal's ability to withstand the rigors of transport.
- Ensure that all animals have met withdrawal dates.
- Confirm that the animal isn't a risk to public or animal health.
- Evaluate animal health, calving status, milk production, and other health factors.
- Cows that are close to calving, actively calving, or have very recently calved are not fit for transport due to welfare concerns. Per regulations, slaughter facilities cannot slaughter animals that are actively calving or have a retained placenta. Fresh cows need to have already passed their placenta before shipping.
- Cull cattle with a recent fracture unrelated to mobility should be transported directly to a packing or processing facility, if the animal is ambulatory.
- Minimize the risk of animals becoming non-ambulatory (downer) during transport.
- Cattle welfare should be considered alongside economic decisions.

Treat, Delay, or Euthanize?

- Exhaustion
- Calving
- Weakness
- Fever greater than 102.5°F
- Lameness to the point that they are in pain or having trouble keeping up with the herd (mobility score 3 or higher)
- Withdrawal times have not been met
- Full udders (delay to dry off)
- Cow has not passed placenta after calving

Delay Transportation & Reassess
(consult veterinarian)

- Pneumonia without fever
- Cancer eye (eye intact)
- Injuries that are not severely affecting mobility
- Prolapse (not severe)
- Hardware with localized signs
- Broken jaw
- Intestinal condition i.e. displaced abomasum
- Sickness that is not a public health concern
- Cows that have calved in the last 48 hours
  - ☐ Cows within two weeks of calving

Transport Direct to Packer
(consult veterinarian)

What to Consider:

- It's important to inform the plant of these issues prior to hauling cattle to salvage slaughter.
- Haul cattle either segregated in their own compartment or with one other quiet animal. Consider bedding for long hauls.
- This list is not all inclusive. All animals will be inspected by USDA FSIS antemortem (before death) and postmortem (after death).

- Fractures of limb and/or spine
- Arthritis with multiple joints
- Severe cancer eye
- Extremely thin
- Cancer/Leukosis
- Severe prolapse uterus
- Nervous disorder or blind in both eyes
- Water belly
- Severe open wounds
- Hernia that impedes movement
- Illnesses with systemic involvement
- Non-ambulatory animals that are not improving

Humanely Euthanize

Not Fit For Transport Examples


Cancer Eye


Retained Placenta


Prolapse (The Drost Project)


Weight-bearing Hoof Injury


Downer

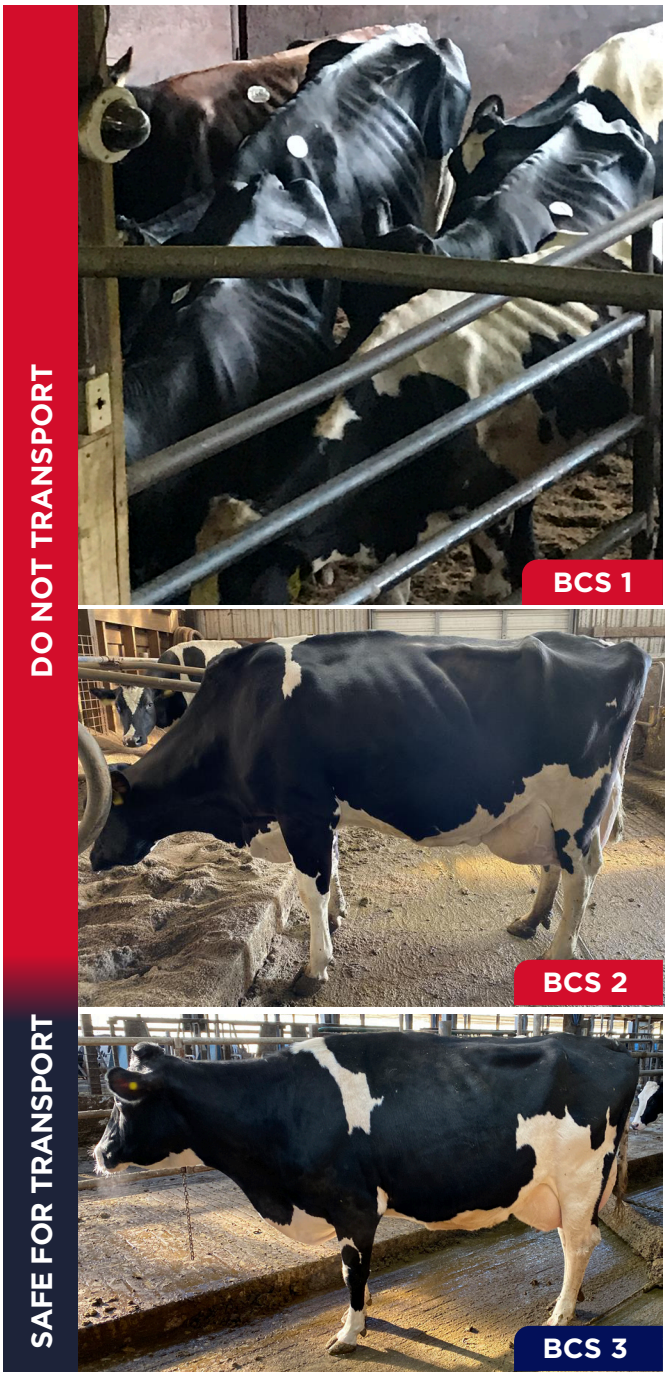
Body Condition Score

In general, improving body condition scores on cull cattle can improve transportation success and product quality. The most recent NBQA displayed the highest percentage of cattle that were too light muscled across all audits for the past 27 years, and there was an increase in the percentage of cattle categorized as too thin, according to body condition scores. Producers should consider market cows and bulls and their eligibility for feeding prior to slaughter in order to increase their muscling and finish, thus improving value.

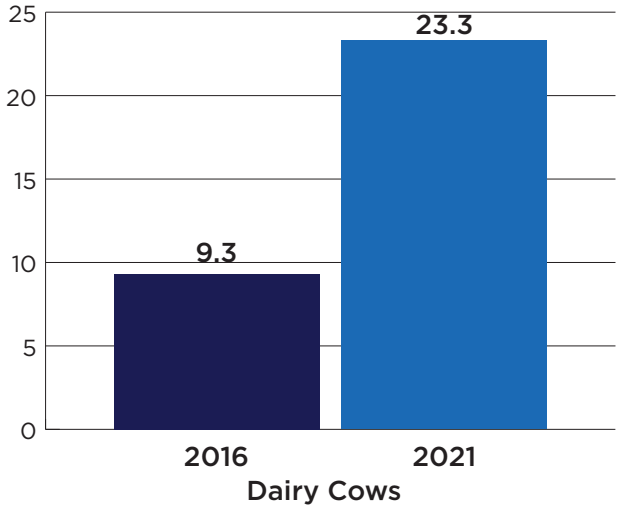
What to Consider:

- Evaluate cattle for body condition score.
  - Do not transport animals that are a BCS 2 or less on beef or dairy scale.
  - Cattle that are extremely thin will not handle the rigors of transport because they are weak, don't have enough energy stores, and are likely to become non-ambulatory.
- Market cattle when they are higher BCS to prioritize animal welfare and improve yield and payment.

When is it Okay to Transport?



Comparison Between Percentages of Cattle Classified as "Too Thin"



"Too Thin" = BCS 1 or 2 (5-point scale)

2022 NBQA

Soundness

Mobility Score of Market Cows & Bulls Entering Packing Plants

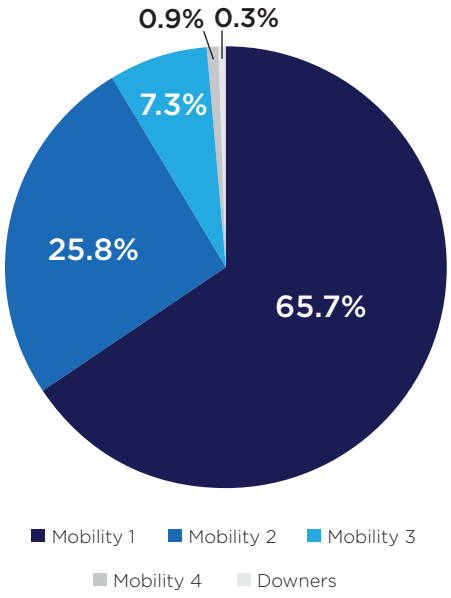
Mobility Score 1 - Normal, walks easily with no apparent lameness or change in gait.

Mobility Score 2 - Exhibits minor stiffness, shortness of stride or a slight limp but keeps up with normal cattle in the group.

Mobility Score 3 - Exhibits obvious stiffness, difficulty taking steps, an obvious limp or obvious discomfort and lags behind normal cattle walking as a group.

Mobility Score 4 - Extremely reluctant to move even when encouraged by a handler. Described as statue-like.

Distribution of Mobility Scores



2022 NBQA

All cull cattle being transported should be sound enough to make the trip, so evaluating lameness/illness prior to loading is critical to the welfare of that animal. If it is suspected that the animal will not make the trip, that animal should not be loaded onto a trailer. If cattle are or become non-ambulatory (downer) when they arrive at the processing plant, they will be condemned and immediately euthanized. Marketing earlier before an animal is spent or crippled may provide an opportunity for these animals to be healthier at a terminal market.

A four-point mobility score is commonly used when evaluating cattle soundness score (see page 11) and determining fitness for transport. It's important to continually monitor any mobility issues and better to address the issue early on.

Mobility score 3s should be strongly scrutinized at the farm or auction market and evaluated for their ability to make the full trip to their end destination and in shape to walk into the processing plant. These are considered compromised cattle, and will likely deteriorate and go from a mobility score 3 to a mobility score 4 on the trip or become non-ambulatory (downer). If mobility score 3s must be transported, travel the shortest distance possible and consider building a relationship with a local packing plant as a marketing outlet.

She's Been Good to You

Your cows have helped maintain profitability over the years. It's time to prioritize her well-being through the end of her life.

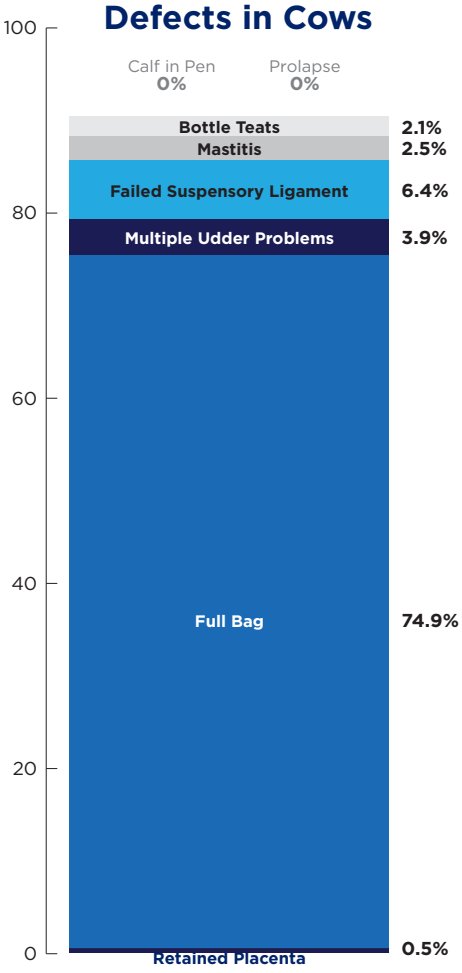
What to Consider:

- Market animals earlier when they first become lame or have mobility issues that could worsen. Treat early and assess response often.
- Evaluate locomotion score before loading onto a trailer.
- Animals should ideally be a Mobility Score of 1 or 2, with special provisions for a score of 3. One special provision would be to send directly to a local packing plant that is the shortest distance possible.
- Do not send mobility score 3s to an auction barn or commercial packing plant.
- If an animal in the shipping pen can not stand for a period of time, and repeatedly tries to lay down, do not transport. It is likely the animal will also lay down in the trailer causing injury or the animal to become non-ambulatory.
- Consider the entire trip the animal must make, including the ability to walk from the truck into the packing plant, when deciding fitness for transport.
- Evaluate animals for injuries, disabilities, or health issues that impair soundness.
- Do not load non-ambulatory (downer) cattle – it is an animal welfare issue and they will be condemned at the plant.
- Do not transport animals that require assistance to rise such as hip lifts or hobbles.

FROM THE SALE BARN:

"We tend to see more mobility issues in dairy cattle compared to beef cattle."

Reproductive Defects in Cows



2022 NBQA

Full Udder

Full udders can cause animal discomfort and mobility issues resulting in welfare concerns like increasing likelihood of falling down or tripping, especially for long transport times. Milk is considered a carcass contaminant in packing and processing due to bacterial loads and is a food safety concern. A full udder at time of slaughter has a high risk of contamination at the packing plant. FSIS does not tolerate milk contamination. If milk from a full udder is spilled on a carcass, contaminated product is cut out, deemed unfit for human consumption, and sent to rendering at a drastically reduced value. Additionally, this process of trimming out contaminated meat causes a backlog on the line for packing plant workers.

What to Consider:

- Evaluate lactation status of animal and consider drying out before sending to market/packing plant.
- Milk cows prior to shipping.
- If possible, ship directly to a plant.
- Full udders are considered a defect, and of all defects in cows identified in the 2022 NBQA, 47.5% were due to full udders.

Foreign Objects: The Hidden Defect

Foreign objects being found in beef products have plagued the industry for more than 30 years. Cattle, especially dairy animals, can consume objects such as wire, nails, bolts, and other items. It is important to keep all working facilities, pens, and other areas cattle may be free of trash. There are other objects of concern (not ingested) that are too commonly found, including birdshot, broken needles, and non-animal objects.

Packing plants are utilizing multiple detection systems to locate foreign objects, such as x-rays, metal detectors, and/or magnets. However, they cannot pick up every foreign object contamination and pieces still get through the system. According to a voluntary survey, 100% of market cow and bull packing plants report finding foreign objects. Of those plants, 50% report customer complaints, meaning further processors or those down the supply chain.

Percentage of Plants Reporting Foreign Objects Found in Beef from Market Cows and Bulls

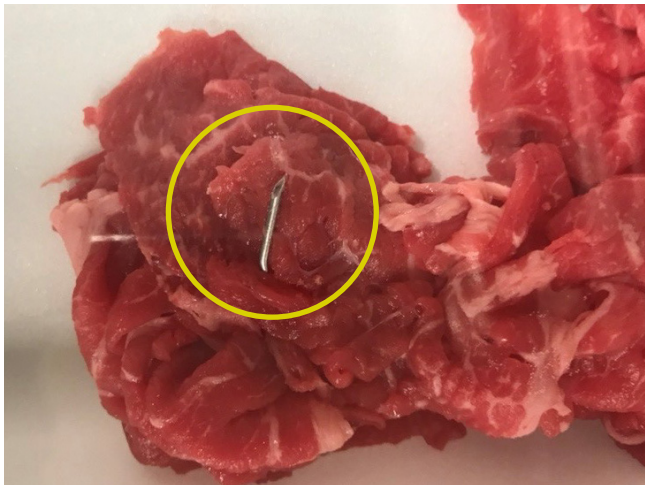
Objects Found	Percentage
Buckshot/Birdshot	100.0
Bullets	18.8
Needles	18.8
Wire	18.8
Darts	18.8
Other	12.5

Source: 2022 National Beef Quality Audit

Any abuse of animals is NOT tolerated.

Broken Needles

A common foreign object found in beef and beef products is broken needles. While the instance of breaking a needle off in an animal may not be entirely preventable, the marketing of that animal into the commercial beef supply while the broken needle remains in the body, is prohibited. When a needle breaks off in an animal during any type of injection, it should be considered an emergency event. Broken needles can quickly migrate away from their entry point. However, with a quick response, broken needles can be retrieved by the producer or veterinarian. Broken needles are preventable. When administering injections, animals should be adequately restrained to prevent excessive movement during the injection. Bent needles are more prone to breaking and should be discarded as soon as they are observed. Using the wrong needle can lead to more bending and "breakoffs" into the animal. While commercial beef slaughter facilities are equipped with measures to prevent foreign objects from remaining in beef products prior to leaving the facility, the methods are not always perfect. Foreign objects have been known to be recovered outside of the slaughter facility. Foreign objects jeopardize the safety of beef products and could be detrimental to consumer confidence.



Needle found in stew meat by end consumer.

Bruising

Bruising can occur at several points throughout the lifecycle, including handling and transportation. Additionally, cattle with a lower body condition score are likely to bruise more severely. Compromised cattle, for example, lame, injured, or sick cattle, are more likely to bruise due to generalized weakness and being more susceptible to going down or being tossed around more during transportation. Not only do those bruises attest to stress and pain during transport but they also will cost the producer and packer as they have to be trimmed from the carcass.

Specific points that can cause more bruising:

- Rough handling during loading and overcrowded transport significantly increase the risk of bruising.
- Horned cattle are more prone to bruising compared to those without horns, and trimming the tips of horns does not alleviate the issue.
- Cows in late pregnancy exhibit higher rates of bruising.

Common Defects in Product

Approximately 45.1% of all cattle surveyed had no visible defects and 37.9% of cattle with defects only displayed a single defect. This demonstrates that producers are making an effort to market cows and bulls before mobility issues and health-related defects progress further, however, there is still room for improvement.

Emergency Slaughter

Emergency slaughter may be considered for animals when recovery is unlikely, treatment facilities are inadequate, or there is insufficient time available for effective treatment and full recovery. It becomes an option when there is a nearby slaughter facility and transport is available to that facility. A veterinary opinion may need to be consulted for advice on the fitness of the animal for transport. Strong consideration should be given to the animal's existing level of pain and distress and what might happen should the process not go according to plan. The animal should also be free of antibiotic or other residues, meet the required standards to avoid being condemned, and be fit for the journey.

Increasing Value

Defects, such as injection site lesions and bruising, negatively impact the overall quality of the end product. However, there are practices to help minimize these defects which can result in improved cattle welfare and increased value for producers. Producers should cull cattle before defects progress and hinder an animal's ability to be marketed. Alternatively, feeding out cull cattle can improve BCS and cow value.

Making the Decision to Euthanize

After all these considerations, if marketing an animal is not an option, then euthanasia should be the correct course of action for the welfare of the animal. Euthanasia is not a failure. It is a way to provide good welfare by removing pain and stress when recovery is prolonged or not likely. It is better to make the decision to euthanize at the farm or ranch before the animal is put through the rigors of transport and potentially becomes non-ambulatory. Always consider the animal's well-being first and quickly make the decision to euthanize and carry it out as soon as possible. Work with a veterinarian to develop euthanasia protocols including training on landmarks and euthanasia tools.

When to Euthanize:

- Fractures in leg, hip, or spine that result in immobility, non-ambulatory, or an inability to stand.
- Seriously lame, crippled, or non-ambulatory disabled animals (including the ones strong enough to get up but may continue to slip because of poor footing).
- Emergency medical conditions that cannot be relieved by treatment.
- Animals that are too thin or weak to be transported due to injury or illness.
- Paralysis from traumatic injury or disease.
- Diseases with no effective treatment that can be a significant threat to human health.
- If animals are not improving in the face of supportive care and treatment.

Euthanasia Protocols

It is the responsibility of all who own or work with livestock to have the proper equipment and knowledge to conduct euthanasia effectively. For euthanasia on the farm or ranch, the most common method is gunshot. Effectiveness depends on selecting the right firearm caliber, bullet type, and ensuring accurate aim to destroy the brain and brain stem for instant insensibility and death. Proper maintenance and cleaning of the firearm are essential. Never select a hollow point or other fragmenting bullet for cattle euthanasia. People who perform this task must be skilled and understand the relevant anatomical landmarks and the protocols used for humane euthanasia of animals. Confirmation of death should occur immediately after and prior to carcass disposal. For more information, refer to the American Association of Bovine Practitioners guidelines or **www.bqa.org.**

Confirming Death

- Lack of pulse
- Continued cessation of rhythmic breathing
- Absence of corneal reflex
- Failure to detect/hear respiratory sounds or heartbeat using a stethoscope under left elbow
- Rigor mortis (carcass is stiff)

Carcass Disposal

There are a number of different options for producers when it comes to carcass disposal. Landfill disposal, rendering, incineration, composting, burial, or working with a licensed dead stock removal company are all valid options. When weighing options for carcass removal, it is important to recognize what is available in the area and what is practical for the operation.

Landfill Disposal

Check with the local landfill to see if they will accept dead livestock. Transportation to the landfill will be the responsibility of the farmer, and some landfills may require particular documentation and may charge a fee.

Rendering

Rendering is the process of converting animal carcasses to useful byproducts through exposure to high temperatures. Rendering can be a good option if available. Rendering services will often have rules on what animals and parts they can accept, such as no carcasses with barbiturates. Consult with the rendering company to understand their rules and expectations.

Incineration

Incineration or burning of carcasses is another option, yet not always practical due to feasibility, high costs, and labor.

Composting

Composting can be implemented quickly and often with minimal costs. Selecting acceptable compost sites and proper maintenance of the compost piles are important.

Burial

When considering burial as a disposal method, it is important to consult with local, state and environmental agencies. Burial site and maintenance, distance from the water table and surrounding waterways, and seasonality are just a few things that must be considered.

Licensed Dead Stock Removal

There are companies that will pick up down and dead animals for use in pet food. To ensure that the subsequent pet food products are safe, these companies cannot take any animals that were given sedatives or euthanized with euthanasia solution. If animals were treated with these substances, make sure this information is disclosed to the dead stock removal company.

FROM THE AUCTION BARN:

"It is a weekly occurrence we have to euthanize a dairy animal at an auction market, that's not okay, that is a welfare issue and public perception issue."

Welfare of each dairy animal in our care is important to consider throughout their life, especially when the decision for them to leave the farm is made. Dairy farms across the country follow a standard for animal care provided by industry program guidelines. These industry programs require protocols involving best management practices, training, and continuing education for farm owners and workers involved in non-ambulatory cow and cull cow management, fitness for transport, and euthanasia. One of the key components of the program is continuous improvement.

As an industry, while we have made great improvements in dairy cattle welfare, health, and productivity, there is still room to improve, especially when it comes to cull cow management and end of life decisions. We need to be honest with ourselves when making culling decisions and deciding if that cow needs to stay or move on. Continuous improvement on dairy farms is a group effort, requiring all farm owners, workers, veterinarians, consultants, and other stakeholders to play a role and take responsibility. We owe it to the cows to do right by them each day, all the way through the end of their life with timely culling or euthanasia decisions.

Making timely decisions about when and how dairy cows should leave the herd impacts individual animal health and welfare and farm profitability. This guide is a valuable resource for farmers and those working on dairies, helping our industry move forward by improving the welfare of individual cows on farms.

Lindsay Ferlito
Dairy Animal Welfare Specialist, Cornell University PRO-DAIRY

FROM THE SALE BARN:

"Eye problems in the fall of the year will result in value discounts. Treated versus non-treated or blind in one or both eyes. Buyers are watching for these defects and bid accordingly."

Timely euthanasia decisions, responsible culling practices, and realistic fitness for transport assessments are considerations that the dairy industry must keep top of mind when shipping cull cattle to slaughter. The first job of the modern dairy cow is to produce high quality milk. When that cow's production begins to fall behind a herd's expectation, she is then sent to slaughter to produce beef. Her first job is milk for your milk shake; her second job is beef for your cheeseburger. Ultimately, dairy cows nourish the U.S. population twice in one lifetime. It is our responsibility as caretakers to ensure our cows are sent to slaughter in good condition so that her last days are comfortable days.

When the time to make an end of life decision for a cow comes, whether it be to treat, cull, or euthanize, we must keep in mind her quality of life. If I treat her, what is her likelihood of recovery? If I ship her, is she going straight to the packer or to a sale barn? Will she physically endure the journey? Will her state of welfare increase, decrease, or stay the same with the decision I just made?

From the packer's perspective, we are counting on the industry to make sound decisions in respect to a cow's welfare and her ability to withstand the rigors of her journey to slaughter. Once a cow is offered for slaughter at a federally inspected plant, the truck driver hauling her in, the plant employees handling cattle, and the cow is under USDA-FSIS regulatory authority.

In federally inspected beef processing facilities, the USDA's Food Safety and Inspection Service (FSIS) conducts a mandatory ante mortem inspection of all live animals upon arrival. This inspection, governed by federal regulations (9 CFR Parts 309 and 313), focuses on two primary areas: humane handling and the animal's overall health. Animals are observed at rest and in motion to assess alertness, mobility, and signs of disease or injury. Based on these evaluations, animals are classified into one of three categories: passed for slaughter, U.S. Suspect (requiring further veterinary evaluation post-mortem), or U.S. Condemned (euthanized and excluded from the food supply). Conditions such as non-ambulatory status, severe lameness, or visible signs of systemic illness automatically result in condemnation.

Operationally, the condition of cattle at arrival has significant implications for both compliance and efficiency. Animals that are too thin, lame, or otherwise compromised are more difficult to unload and handle, increasing the risk of regulatory violations and safety hazards. FSIS regulations prohibit moving healthy animals over downed ones, and delays in unloading can disrupt plant operations and extend transport times, which further stresses the animals. If an animal becomes non-ambulatory at any point, it must be humanely euthanized and cannot enter the food chain. Ensuring cattle are fit for transport and able to walk unaided through the facility is essential for maintaining humane standards, regulatory compliance, and the integrity of the beef production process.

Lacey Alexander
North American Beef Welfare Lead at Cargill

Tim Delaney
DVM, Director of Food Safety and Regulatory Affairs
Fed Beef Commercial Beef Packer

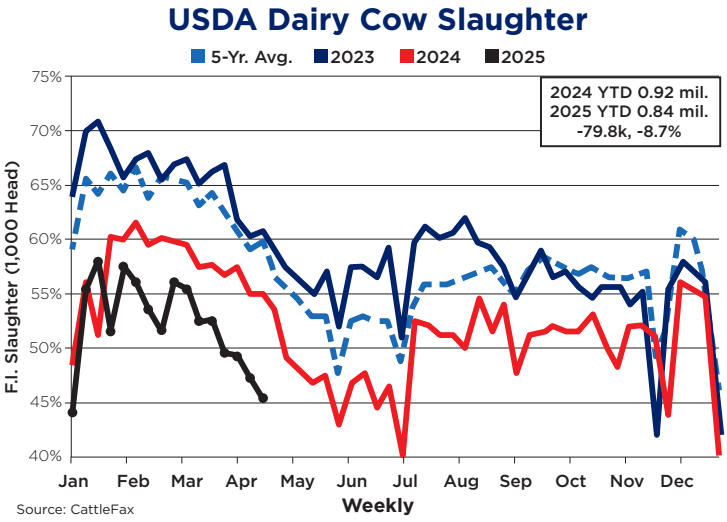
Adding Value to Dairy Cull Cows

Matthew McQuagge & Patrick Linnell, CattleFax, May 2025

Introduction

The marketing of cull cows is a weekly task on most large (250+ head) dairies. Over the last five years, the dairy industry as a whole has recorded an average culling rate of 32.6% based on USDA dairy cow inventories and commercial slaughter numbers. Despite the fact that roughly a third of an operation's cow herd is sold each year, the management and marketing of these culls is frequently an afterthought. These animals are often viewed as a byproduct of the milk-producing process despite making up around 8% of an operation's gross revenue in the last few years. This may be especially true in more recent years with the proportionately larger increase in value of calves due to the increased utilization of beef genetics for non-replacement cows. The following discussion takes a closer look at the cull cow market and highlights opportunities for dairy producers to consider in maximizing the value of cull cows from the operation.

Intentional management and marketing of cull cows is important to take advantage of these record-high prices. Management strategies can include everything from animal health to the seasonality of prices. In many ways, good animal welfare is simply good economics. Identifying issues early and marketing culls in a timely fashion helps avoid situations that result in death loss, itself a significant lost financial opportunity. Even health or mobility challenges that are allowed to progress can result in sharp discounts.



The cull cow market typically maintains a consistent seasonal price pattern that follows dynamics of the beef cow herd. Cull cow values are the strongest during the spring and summer when light supplies are combined with strong demand. During this period, limited beef culling activity is occurring leading to fewer cows being brought to the market. At the same time, dairy cow harvest reaches its lowest levels of the year. Finally, summer grilling activity drives strong ground beef demand, especially during the summer holidays. The period around Labor Day represents the tipping point towards weaker prices in the fall with around an average decline of 15% noted from the August highs to the November lows.

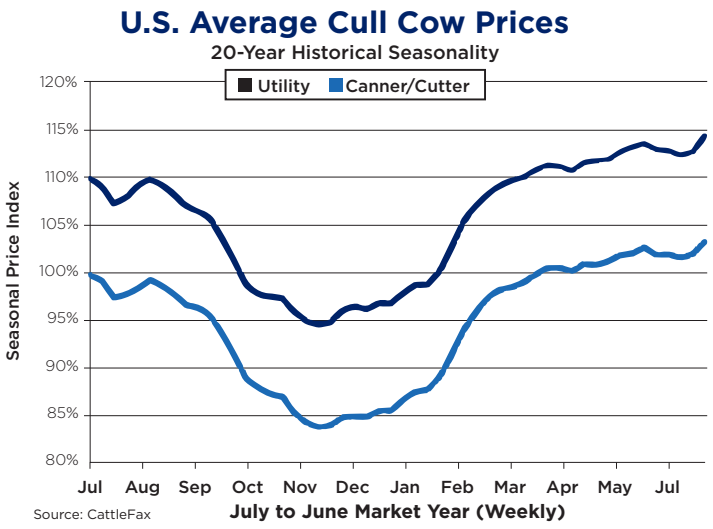
With an average culling rate of 32.6%, dairy cows are sent to slaughter for a multitude of reasons. According to a USDA National Animal Health Monitoring System Dairy Study, infertility and poor production are the most common reasons for cows leaving the herd, each accounting for 21.2% of removals (Dairy, 2014). This is followed by clinical mastitis and lameness at 16.5% and 7.2%, respectively, with a variety of other causes making up the remainder of the cull decision process (Dairy, 2014). While each issue presents its own challenge when considering options to add value to these animals, there is still potential for appropriate management strategies.

When considering different strategies to improve the value, one first step is to identify ways to eliminate or minimize issues that result in discounts at the time of sale. The 2022 National Beef Quality Audit identified numerous traits or defects at the time of slaughter that were associated with markdowns when sold as live animals. One of the more concerning results from the audit was the increase in udder problems across time. In this audit, 74.9% of dairy cows had a full udder at the time of harvest which can create challenges in the slaughter process as well as serve as a potential contaminant and lead to discounts in the sale ring (NBQA, 2022). Lameness issues, another defect that saw an increased occurrence relative to the previous audit, was noted in greater effect in dairy cows with 8.5% of these animals having decreased, or worse, mobility (NBQA, 2022). This challenge, aside from being an animal welfare issue, will lead to further discounts at the point of sale due to the risk taken on by the buyer.

Another issue noted in the audit was the large occurrence of light muscled and conditioned animals. Within the 2022 Audit, 23.3% of dairy cows were identified as being "too thin" with a Body Condition Score of 1.0 or 1.5 on a 5-point scale (NBQA, 2022). Furthermore, 95% of dairy cows were inadequately muscled with a muscle score of 1 or 2 on a 5-point scale (NBQA, 2022). These rates highlight areas for increasing the profit potential on these animals and will be discussed in further detail below.

Timely Marketing

Once a decision has been made to cull an animal, the next step is to determine when to market it. On many operations, the duration between the decision and marketing lasts only until the next sale at the local auction market. However, opportunities exist to tweak the marketing window to capture a higher value, even if only done on a small portion of cattle. The seasonality of cow prices suggests an average 8% price increase just from January to February which, at current prices, is the equivalent of an extra $10/cwt holding at a constant weight for just 30 days. This gain can be compounded if the animal is fed to gain weight through that period. On the flip side of the seasonal pattern, it can be advantageous to marginally shift late-summer culling decisions forward to avoid the average 15% decline from August highs to November lows. There is a strong financial incentive to manage around the seasonal patterns as that average drop equates to a decline of about $30/cwt at current market levels.



Seasonality aside, a delay of marketing can have financial incentives in other situations. A prime example would be cows that are culled while still milking. Holding these animals an extra couple weeks past the end of milking will allow the udder to dry up and thus eliminate any "full udder" discounts, while also likely adding flesh and weight.

It is important to recognize limitations here as certain culling criteria restrict potential to delay the sale of cattle. Toxic mastitis, for example, limits the duration that these animals can be held past the withdrawal period of any treatments. Lameness defects are another issue in which animal welfare doctrine prefers that the sale of these animals should not be delayed. In fact, the audit results indicate that there is a percentage of mobility-challenged dairy cows that should be sent to harvest sooner than what commonly occurs. Ultimately, the decision to advance or delay the marketing of an animal has economic incentives on a case-by-case basis.

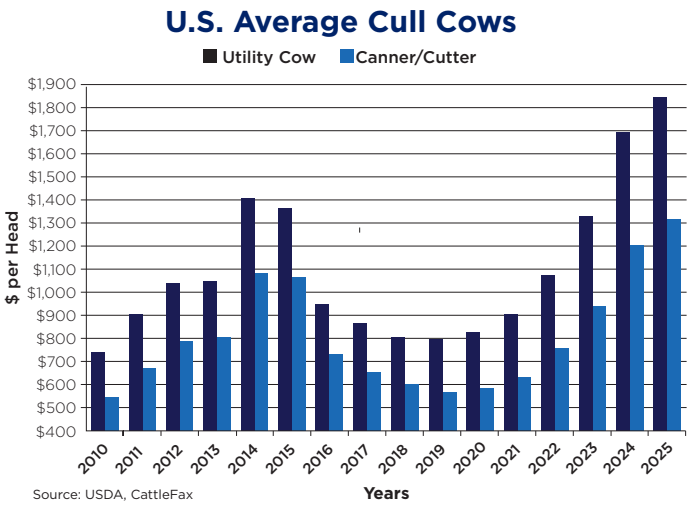
Direct Marketing

According to the USDA Dairy Study, 58.3% of dairy cows are sent to a market or auction barn on their way to harvest (Dairy, 2014). The marketing and other services provided by auction markets provide value in connecting sellers with the right buyers. That said, opportunities exist to market cull cows directly to a packer, especially for a larger group of cows. On average, 33.5% of dairy cows followed this path of going straight to harvest in that study (Dairy, 2014). It was noted that this practice was much more common on larger dairies (500+ head) than it was on smaller operations (<100 head). While proximity to a harvest facility is often a key factor, direct marketing should be a consideration if mobility is challenged but adequate as it simply reduces the loading, unloading, and sorting activity for those animals.

Retaining and Adding Weight

The Quality Audit found that there has been an increase in the percentage of thin and light muscled dairy cows over the years. Opportunities exist for improvement on cull cow condition while increasing revenue from a producer standpoint. It is important that the prospects of adding weight are considered in the lens of costs versus added value.

The primary target in adding weight to cows before sending them to harvest is the price spread between quality grades. Over the last five years, Utility grade cull cows have averaged



a 41.6% price premium to Canners and Cutters which, at current levels, results in an additional $500+ per head. This improvement in condition can often be achieved by feeding non-milking cull cows a high energy ration for 30 to 60 days.

A simple budget is a powerful tool to determine the economic potential of feeding cows. Considering price seasonality, the budget can be calculated at different times of the year to ensure that feeding remains a profitable strategy. In the current market environment, record high slaughter cow prices coupled with relatively inexpensive feedstuffs make improving body muscle and condition scores in culls a very attractive prospect. The accompanying calculator uses current prices and estimates and serves as a template that producers can follow by swapping out their own local cow prices and estimated costs per pound of gain. If desired, more detailed expenses such as labor, interest, and treatment costs can be added in.

In weight (lbs.)	1,200
Canner/cutter price	$120.00
Value/head	**$1,440**
Cost of gain ($/lb.)	$1.30
Gain (lbs.)	200
Feeding cost	$260
Death loss (2%)	$29
Total cost	**$289**
Out weight (lbs.)	1,400
Utility cow price	$138.00
Value/head	**$1,932**
Profit (loss) $/hd	**$203**

Costs and performance associated with retaining cull cows will vary greatly between operations. So too do the practical constraints of maintaining an additional inventory class on an operation. Many producers operate near or at their physical capacity and do not have the space necessary to house, feed, and maintain additional, non-milking cows. Bunk space comes at a premium, particularly as the U.S. dairy cow herd is in the process of expanding with a larger percentage of replacement heifers requiring time and resources.

Operations utilizing this strategy can make further considerations with regards to the selection of which cull cows to retain. By selecting cows based off body condition score, dairy producers have an opportunity to increase net returns by selecting lighter fleshed animal that have greater ability to increase their quality grade. Thinner cows can combine the advantages from increasing weight and price seasonality with the premiums from improving their grade classification. Cows need to have health and mobility as well, making this opportunity particularly attractive for the large percentage of cows culled due to poor production. Cows that start out with a higher body condition score may be less likely to capture value from upgrading quality grades.

Conclusion

Just as every livestock operation is different in many respects, the best options for adding value to cull cows are also widely varied. As producers consider different strategies for managing their cull cows, ultimately business decisions should be made by comparing the changes in costs and revenues (i.e., a partial budget analysis). If the positive changes outweigh the negative, then the proposal has net gain and further considerations can be made regarding non-cash factors such as potential risks and operational constraints.

It's important to recognize that cull cow marketing is rarely an all-or-nothing decision. Different culling criteria lends themselves well to different management and marketing strategies. Opportunities include managing around the seasonality of prices, marketing directly to harvest facilities, and feeding out cows to improve their weight and condition scores. Another strategy not discussed was rebreeding cull cows and selling bred females to another dairy. The USDA Dairy Study found that 7.3% of cull cows were sent to another dairy (Dairy, 2014). This can be a favorable option for lower-performing cows that can still work on a different operation, especially with current record replacement prices. Ultimately, cull cow management and marketing on the dairy is an important part of the business that deserves attention, rather than just serving as a byproduct from producing milk.

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RIGHT WAY. RIGHT TIME.

2025

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A Guide to Cull Dairy Cattle Management

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