



Animal Care

Reference Manual

VERSION 4.0 ABBREVIATED



FARM ANIMAL CARE MANUAL VERSION 4.0

This manual is an abbreviated version of the soon-to-be released comprehensive FARM Animal Care Reference Manual Version 4.0, which will include resources, references and appendix documents.



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This manual is not a legal document and is intended for educational purposes only. Dairy farmers are individually responsible for determining and complying with all requirements of local, state and federal laws and regulations regarding animal care.

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Chapter 1: Introduction

ABOUT FARM

Today's consumers expect – and deserve – safe, wholesome dairy products from people who are producing it responsibly.

U.S. dairy farmers have a strong track record of providing excellent animal care. The National Dairy FARM Program: Farmers Assuring Responsible Management™ demonstrates dairy farmers' ongoing commitment to the highest standards in the industry and demonstrates that **they're doing what's right for the cows, for customers and for consumers** who are more curious – and skeptical – than ever before about how their food is raised and produced.

As science and best practices evolve alongside public attitudes and perceptions, the dairy industry must continue to show its customers and consumers that we're holding ourselves to the highest standards of animal care. The National Dairy FARM Program does just that.

While 55 percent strongly agree that if farm animals are treated decently and humanely, they have no problem consuming meat milk and eggs, only 25 percent believe U.S. meat is derived from humanely treated animals.

[The Center for Food Integrity, 2017](#)

Launched in 2009, the FARM Program helps earn the public's trust, demonstrating that dairy farmers share their values and are committed not only to quality animal care, but also to ensuring safe, wholesome milk, high standards of environmental stewardship and exceptional work environments through its four program areas. The Animal Care Program is the cornerstone of the FARM Program. More than 98 percent of the U.S. milk supply comes from participating farms.

FARM Program Areas

[Animal Care](#) [Environmental Stewardship](#) [Antibiotic Stewardship](#) [Workforce Development](#)

FARM works with you, the producer community and industry partners, to provide comprehensive resources, ongoing training and other educational tools to assist in creating a culture of continuous improvement for animal care.

The goal of FARM is to unite the dairy industry around best management practices and demonstrate the excellence that occurs on your farm every day through science and outcomes-based standards that are facility, size and geography neutral. The on-farm evaluation serves as a snapshot in time of those best management practices. However, FARM can only provide the foundation and framework of excellent animal care. Producers must take forward and instill excellence in animal care daily through their farms' culture by way of active leadership, oversight and management. FARM does not ensure a culture, guarantee that best management practices are followed or replace supervision or management.

Implementing FARM

Created by the National Milk Producers Federation (NMPF), with support from Dairy Management, Inc. (DMI), the FARM Program raises the bar for the entire industry – creating a culture of continuous improvement.

The FARM Animal Care Program establishes:

- On-farm best management practices
- Standards for second-party on-farm evaluations
- Third-Party verification to guarantee the rigor and integrity of FARM Animal Care Program implementation

The FARM Program provides comprehensive resources to implement the program at the farm and participant level, including manuals, templates, posters and videos, that are available online at nationaldairyfarm.com.

Animal Care Standards

Science-based Outcomes-based

The FARM Program Technical Writing Group, which includes representation from dairy farmers, the veterinary community, co-ops, processors, dairy organizations and university animal care experts, guides the program – ensuring that it fosters a culture of continuous improvement and that the best management practices, which are the cornerstone of the program, evolve with the latest research on animal care.

Participants

National Dairy FARM Animal Care Program participants are any cooperative, proprietary processor, milk handler or organization that has a signed current participation agreement with FARM on behalf of their membership, patrons or direct shippers. Participants manage the FARM Animal Care Program on behalf of the farms and facilities belonging to the milk handling entity.

Second-Party Evaluation

The Second-Party Evaluation, completed on every participating dairy facility at least once every three years, provides dairy farms with an external review of their animal care practices based on FARM Program guidelines.

The results of the Second-Party Evaluation provide dairy farmers with a snapshot and overview of the farm's current animal care practices. If areas of improvement are identified through the Second-Party Evaluation, action plans are generated to demonstrate continuous improvement toward the industry's best animal care practices and standards.

Only a qualified individual who has completed an annual FARM certification training is qualified to conduct the evaluations. Typically, Second-Party Evaluators are co-op/processor staff, veterinarians or independent dairy consultants.

Trained Second-Party Evaluators work with you to identify strengths and, if necessary, outline improvements and work alongside dairy farmers to ensure the highest standards of animal care.

Evaluators must have at least a combination of five years of education and/or on-dairy farm industry experience, which can include animal science, dairy science or other relevant curriculum. Evaluators must apply, complete a phone interview, attend classroom and on-farm training, pass competency exams and re-certify annually.

Facility Certification

A dairy facility is considered certified in the FARM Animal Care Program if it:

- Is up to date with the FARM Animal Care Program evaluation in accordance with the program evaluation cycle
- Does not have any overdue corrective action plans
- Is not subject to the FARM Willful Mistreatment Protocol

Accountability Measures

At the conclusion of a Second-Party Evaluation, corrective actions may be generated based on FARM Animal Care Program standards not being met at the time of the evaluation. Accountability measures are categorized by level of significance. They include:

- Immediate Action Plan (IAP)
- Mandatory Corrective Action Plan (MCAP)
- Continuous Improvement Plan (CIP)

Corrective actions can lead to Conditional Certification and Conditional Decertification if left unresolved beyond the timeframes designated by FARM or sooner per the FARM program participant.

Conditional Certification

If corrective action plans are not satisfactorily resolved by the date set by FARM or the FARM Animal Care Participant, the facility will have a Conditional Certification for up to 60 days; a FARM Animal Care Participant may continue to market milk from a facility with a Conditional Certification and remain in good standing with FARM. If the plan is resolved within the 60-day period, the facility will be returned to full certification status.

Conditional Decertification

If corrective action plans are not satisfactorily resolved by the date set by FARM or the FARM Animal Care Participant, and the facility has had Conditional Certification for 60 days without satisfactorily resolving the plan, the facility will be considered Conditionally Decertified. A FARM Animal Care Participant may not continue to market milk from a facility with a Conditional Decertification and remain in good standing with FARM. Evidence of plan resolution must be provided to FARM in order for the facility to be returned to full certification status.

Immediate Action Plan

An Immediate Action Plan (IAP) is triggered if a facility fails to comply with the FARM Program standard that bans routine tail docking. Failure to meet the standard will result in the facility being placed on Conditional Certification for resolution for up to 48 hours. If the facility meets the standard by resolving this action plan within 48 hours, a follow up will be conducted by an evaluator at one week, one month, and three months to ensure routine tail docking has ceased.

If the facility continues to not meet the standard after this timeframe, the facility will be Conditionally Decertified until the standard is met.

Mandatory Corrective Action Plans

Additional best management practices have been identified as having significant importance in ensuring sound animal care. The following animal care standards, if unmet at the time of an evaluation, will generate a Mandatory Corrective Action Plan (MCAP).

Veterinarian Review

- The facility has a written Veterinarian-Client-Patient Relationship (VCPR) form that is signed by the farm owner and Veterinarian of Record (VOR) annually.
- The written Herd Health Plan is reviewed annually by the VOR.

Pre-Weaned Calves

- Pre-weaned calf practices and protocols that demonstrate pre-weaned calves are:
 - Disbudded prior to 8 weeks of age
 - Provided feed and water access by day 3
 - Moved using proper methods
 - Provided quality and quantity of colostrum/colostrum replacer, milk/milk replacer, feed and water are provided

Non-Ambulatory Animals

- Non-ambulatory animal practices and protocols that demonstrate non-ambulatory animals are:
 - Moved using proper methods
 - Provided prompt medical care
 - Provided access to feed, water, protection from heat and cold for typical climatic conditions, isolation from other ambulatory animals and protection from predators

Euthanasia

- Euthanasia practices and protocols that demonstrate the following:
 - Criteria for the identification of animals to be euthanized are established
 - Euthanasia techniques follow the approved methods of AABP and/or AVMA
 - Carcass disposal is conducted using the appropriate method

Fitness to Transport

- Acceptable fitness to transport protocol

MCAP

FARM Program standards require that MCAPs are met within nine months. However, a Participant/Evaluator may require that a standard be met before the 9 month deadline.

Failure to meet these standards within the allotted timeframe will result in the facility being placed on Conditional Certification, leading to Conditional Decertification if standards are not met in a 60-day period.

Water and Feed Access

- Feed access for all age classes; pre-weaned calves by day 3
- Water access for all age classes; pre-weaned calves by day 3

Continuing Education

- Signed Cow Care Agreement for any **non-family employees** with animal care responsibilities
- Job specific continuing education for **non-family employees** with animal care responsibilities if they are responsible for:
 - Stockmanship/Handling
 - Pre-weaned calf care
 - Non-ambulatory animals
 - Euthanasia
 - Determining animals that are fit for transport

The MCAP will be created with their Second-Party Evaluator with a set timeframe for re-evaluation of progress toward completing all MCAPs, **not to exceed 9 months.**

Continuous Improvement Plans (CIP)

Animal observation benchmarks and additional best management practices have been identified as areas that also demonstrate excellence in animal care. The following animal care standards, if unmet at the time of an evaluation, will generate a Continuous Improvement Plan (CIP).

A CIP will be triggered if the farm does not meet the following standards at the time of the Second-Party Evaluation:

- Animal observation benchmarks
 - Body condition score | 99% or more of all animals 3 days of age and older have a body condition score of 2 or greater on the FARM Body Condition Scorecard
 - Hock/Knee | 95% or more of the lactating herd score 2 or less on the FARM Hock/Knee Scorecard
 - Locomotion | 95% or more of the lactating herd score 2 or less on the FARM Locomotion Scorecard
 - Broken tails | 95% or more of lactating animals do not have broken tails
- Pain management practice and protocol for disbudding
- Permanent written or electronic drug treatment records are maintained

CIP

FARM Program standards require that CIPs are met within 3 years or less, however, a Participant/Evaluator may require that a standard be met before the 3 year deadline.

Failure to meet the standard within this allotted timeframe will result in the facility being placed on Conditional Certification, leading to Conditional Decertification if standards are not met in a 60-day time period.

Evaluators and participants can create CIPs for additional standards that have not been designate by FARM.

- **Continuing Education**
- Signed Cow Care Agreement for any **family employees** with animal care responsibilities
- Job-specific continuing education for **family employees** with animal care responsibilities if they are responsible for:
 - Stockmanship/Handling
 - Pre-weaned calf care
 - Non-ambulatory animals
 - Euthanasia
 - Determining animals that are fit for transport

Third-Party Verification

Once a Second-Party Evaluation is complete, the dairy facility is eligible to be randomly selected, through statistical sampling, to undergo Third-Party Verification. The statistical sampling includes selection criteria such as FARM participant geographic location, size and operation type to ensure that the number of randomly selected dairy farms mirrors participants in the entire program.

FARM Integrity
Qualified Third-Party Verifiers evaluate a representative percentage of farms each year to ensure the integrity of the program.

Verification helps ensure that the program accomplishes its goals and objectives by ensuring the Second-Party Evaluators are upholding the integrity of implementation of the program. Third-party Verifiers must meet the same qualifications as Second-Party Evaluators.

USING THE MANUAL

This Animal Care Reference Manual is an easy-to-use, comprehensive resource detailing animal care and management guidelines of the FARM Program. It's an educational tool for all participating dairy farmers, co-ops, proprietary processors, trained Second-Party Evaluators and Third-Party Verifiers.

Along with the guidelines, this document provides extensive information, resources and references that while thorough, are not exhaustive nor prescriptive for singular approaches toward meeting the guidelines of the program. This reference manual is not a legal or regulatory requirement for the dairy industry. It is intended to serve as a wide-ranging educational resource for the dairy industry across the United States.

Best practices identified in the manual are not the only practices that can meet the identified guidelines. The application of some management practices may vary due to certain regional norms, weather or other conditions. Dairy farmers should work with their trusted advisors and management team members to develop appropriate management approaches to meet the identified guidelines.

FARM Program materials are living documents. Guidelines are reviewed every 3 years by the FARM governance committees and are subject to updates based on new science-based animal care and well-being research. This is part of the FARM Program's commitment to continuous improvement.

Management Checklists

The Management Checklist details key on-farm guidelines and best practices. Management Checklist points are listed at the beginning of each chapter and within the chapters under corresponding topics.

- ✓ **The facility has a written Veterinarian-Client-Patient Relationship (VCPR) that is signed by the farm owner and Veterinarian of Record (VOR) annually.**

DEFINITIONS

For the purposes of the FARM Animal Care Reference Manual, the following words are defined as follows:

Animal Welfare: How an animal is coping with the conditions in which it lives. An animal is in a good state of welfare if (as indicated by scientific evidence) it is healthy, comfortable, well nourished, safe, able to express innate behavior, and if it is not suffering from unpleasant states such as pain, fear and distress. Good animal welfare requires disease prevention and veterinary treatment, appropriate protection from heat and cold, management and nutrition, humane handling and humane slaughter/euthanasia. Animal welfare refers to the state of the animal; the treatment that an animal receives is covered by other terms such as animal care, animal husbandry and humane treatment.

Banding: The application of an elastic band to cut off blood supply to the scrotum and testicles, which eventually fall from the body.

Best Practice: An animal care guideline, protocol or practice that achieves the desired outcome described by the corresponding Management Checklist Point. More than one best practice may exist for a corresponding outcome. For example, a best practice for an “effective record keeping system,” which is a FARM Program guideline, may be individual written animal health logs or a computer record system such as DairyComp305.

Acronyms

| | |
|--------------|--|
| AABP | American Association of Bovine Practitioners |
| ADT | Animal Disease Traceability |
| AVMA | American Veterinary Medical Association |
| BCS | Body Condition Scoring |
| CIP | Continuous Improvement Plan |
| DMI | Dairy Management, Inc. |
| HAACP | Hazards Analysis and Critical Control Points |
| MCAP | Mandatory Corrective Action Plan |
| NMPF | National Milk Producers Federation |
| SOP | Standard Operating Procedures |
| TMR | Total Mixed Ration |
| USDA | United States Department of Agriculture |
| VCPR | Veterinarian-Client-Patient Relationship |
| VOR | Veterinarian of Record |

Body Condition Scoring (BCS): A common dairy practice used to determine the nutritional status of an individual heifer or cow, or to evaluate the average condition for a group. Animals are evaluated on a 5-point scale, with 1 being extremely thin and 5 being extremely fat.

Bred Heifer: A young, pregnant dairy animal that has not yet given birth to her first calf, typically 13-to-24 months of age.

Breeding Bull: A male bovine used for breeding.

Castration: The process of removal or destruction of the testicles.

Continuous Improvement Plan (CIP): A written plan that identifies any area(s) for improvement in animal care. A CIP requires that action has been taken to meet the standard within a minimum of three years, but FARM Animal Care participant/evaluator may set a deadline sooner than three years. Failure to meet this standard within this allotted timeframe will result in the facility being placed on Conditional Certification, leading to Conditional Decertification if standards are not met in a 60-day time period. Evaluators and participants can create CIPs for additional standards that have not been designated by FARM.

Cow Care Agreement: An agreement signed by all family and non-family employees with animal care responsibilities indicating that: (1) they have received annual training at least in animal handling and stockmanship; (2) they agree to care for all animals humanely and with respect and will not participate in animal abuse of any kind, and (3) they will report any abuse to the farm owner or manager should they witness it. This document must be signed annually.

Dehorning: Removal of the horn per AABP guidelines after it has attached to the skull (approximately 8 weeks of age).

Disbudding: A procedure to stop the growth of or removal of the horn tissue per AABP guidelines before the horn bud has attached to the calf's skull (less than 8 weeks of age).

Distress: Occurs when livestock are injured, sick or in pain.

Dry Cows: Non-lactating pregnant cows from the end of lactation until next parturition. A pregnant cow is generally dry or non-lactating for a period of 40-to-60 days before the next calving.

Dystocia: Difficult birth typically requiring assistance from the animal caretaker.

Employee with Animal Care Responsibility: A family or non-family employee on the farm responsible for the care of dairy animals.

End of Life: On-farm death due to illness, euthanasia or death at a packing house.

Failure of Passive Transfer (FPT): The condition when calves do not receive enough colostrum immunity from their dam. In the cattle industry, a common criterion to define FPT is when calves have a serum (or plasma) IgG concentration less than 10 grams per liter at 24 hours of age.

Freemartin Heifer: A sexually imperfect, usually sterile, female calf twinborn to a male.

Growing Animals: The period between weaning and first parturition during which an animal grows through puberty and begins to approach maturity, approximately from 6 weeks to 24 months of age. See also Bred Heifer, Open Heifer and Springing Heifer.

Herd Health Plan: An animal health management system developed with a veterinarian to prevent, diagnose, control and treat disease or injury of all dairy cattle on a farm.

Hock and Knee Scoring: An assessment for adequacy of bedding and stall comfort for an individual animal or the average condition for a group. Animals are evaluated on a 3-point scale, with 1 being no hair loss or swelling and 3 being severe swelling or lesion.

ISO-Certified Company: A company that has gone through a certification process approved by the International Organization for Standardization (ISO). ISO is a worldwide federation of national standards bodies that creates consistent rules or guidelines of technical specifications.

Lactating Dairy Cow: Any bovine female that has had her first calf.*

Licensed Veterinarian: Licensed by one or more state boards of veterinary medical examiners to practice veterinary medicine within the respective state(s).

Locomotion Scoring: An assessment of lameness for an individual animal or the average condition for a group. Animals are evaluated on a 3-point scale, with 1 being sound and 3 being severely lame.

Mandatory Corrective Action Plan (MCAP): FARM Program standards require that MCAPs are met within nine months. However, a Participant/Evaluator may require that a standard be met before the 9 month deadline. Failure to meet these standards within the allotted timeframe will result in the facility being placed on Conditional Certification, leading to Conditional Decertification if standards are not met in a 60-day period.

Milking Cows: Cows that are lactating.

Newborn Calf: Young cow, from birth through colostrum feeding, typically the first 48 hours of life.

Nutrient Management: Management of handling of manure on the farm.

**This definition is written in such a way that allows FARM Program Second-Party Evaluators to easily separate different classes of animals for observation and analysis. It is important to note that this definition differs from that of the Food and Drug Administration classification of animals for approved drugs. The FDA classifies such animals as follows: "The term 'non-lactating dairy cattle' includes replacement dairy heifers, replacement dairy bulls, and dairy calves, according to current animal industry standards and a long-standing FDA practice. These classes of dairy cattle have not yet, or would never produce, milk for human consumption. The term non-lactating dairy cattle does not include dry dairy cows. Dry dairy cows have previously produced milk for human consumption and will again in the future after completion of the 'dry period' between lactations."*

Open Heifer: A young bovine female that has not yet become pregnant.

Pain: An unpleasant physical sensation occurring in varying degrees of severity as consequence of injury, disease or from a medical or management procedure.

Patient: An animal that receives medical attention, care or treatment.

Pre-Weaned Calf: A calf being fed milk or milk replacer from newborn through weaning.

Protocols: Written processes that provide specific instructions to cow-side personnel for performing a single, specific task. As a training tool, written protocols improve communication and work consistency. They may include instructions provided by the Veterinarian of Record for the management of dairy cows in various situations and under various conditions.

Second-Party Evaluation: An external review and assessment of on-farm animal care practices on a participating farm based on the National Dairy FARM Program guidelines. Participating farms must undergo a Second-Party Evaluation at least once every 3 years.

Second-Party Evaluator: A trained dairy professional certified by the FARM Program to complete on-farm Second-Party Evaluations. Only a qualified individual who has completed annual FARM certification trainings is qualified to conduct Second-Party Evaluations. Typically, Second-Party Evaluators are co-op/processor staff, veterinarians or independent dairy consultants.

Evaluators must have at least a combination of five years of education and/or on-dairy farm industry experience, which can include animal science, dairy science or other relevant curriculum. Evaluators must apply, complete a phone interview, attend classroom and on-farm training, pass competency exams and re-certify annually. Evaluators must recertify annually and complete all requisite training to maintain their certification and ability to conduct on-farm evaluations.

Special-Needs Animals: Sick, injured or non-ambulatory dairy cattle.

Pre-Fresh Heifers: A heifer that is in the last few weeks of pregnancy.

Stockmanship: The knowledgeable and skillful handling of cattle, based on accepted animal behavior principles, in a safe, efficient, effective and low-stress manner.

Third-Party Verification: A process by which Third-Party Verifiers inspect a representative percentage of participating farms each year to provide statistically verified data regarding adherence to FARM Program guidelines. Once a Second-Party Evaluation is complete, the dairy facility is eligible to be randomly selected, through statistical sampling, to undergo Third-Party Verification. The statistical sampling includes selection criteria such as FARM participant geographic location, size and operation type to ensure that the number of randomly selected dairy farms mirrors participants in the entire program. Verification helps ensure that the program accomplishes its goals and objectives by ensuring the Second-Party Evaluators are implementing the program with integrity.

Third-Party Verifier: A trained and qualified person who does not have a conflict of interest in the operation or the outcome of the verification process. Third-party Verifiers must meet the same qualifications as Second-Party Evaluators (above).

Transition Cows: Cows or heifers that are transitioning from the period of late gestation (pregnancy) through the period of early lactation, that is, about 3 weeks prior to and about 3 weeks after calving (periparturient period).

Veterinarian-Client-Patient Relationship (VCPR): The FARM Program uses the American Association of Bovine Practitioners (AABP) definition of VCPR. See Chapter 2: Veterinarian Review for the full definition of a VCPR.

Veterinarian of Record (VOR): The Veterinarian of Record is the responsible party for providing appropriate oversight of drug use on the farm operation. Such oversight is a critical component of establishing, maintaining and validating a VCPR. This oversight should include but may not be limited to establishment of treatment protocols, training of personnel, review of treatment records, monitoring drug inventories and assuring appropriate labeling of drugs.

Weaned Animal: A young calf that is no longer being fed milk or milk replacer and has been transitioned to eating only dry feed.

Chapter 2: Veterinarian Review

Management Checklist

- ✓ The facility has a written Veterinarian-Client-Patient Relationship (VCPR) that is signed by the farm owner and Veterinarian of Record (VOR) annually within 12 months.
 - ✓ The written Herd Health Plan is reviewed annually by the Veterinarian of Record (VOR).
 - ✓ The facility has permanent (written or electronic) treatment records for the treatment of the facility's common diseases that include:
 - Date of treatment
 - Animal treated identification
 - Name of treatment used
 - Disease/condition being treated
 - Dosage administered
 - Route of administration
 - Duration of the treatment
 - Specified withdrawal times for milk and meat to ensure food safety
-

Expectations of the Veterinarian Community

Dairy veterinarians serve as trusted partners to producers across the country. As continued research and innovation drive change in on-farm animal care, the veterinarian's role is more important than ever before. It's not just about treating sick animals, it's about working hand-in-hand with producers to provide guidance when it comes to cow comfort, disease prevention, antimicrobial stewardship, herd health and overall animal care.

In this ever-changing environment, dairy veterinarians must strive to be engaged team members who are open-minded, forward-thinking and maintain open lines of communication with their clients. It's vital that they stay up to date on the latest research-based practices and protocols for dairy animal welfare and judicious antibiotic use, and dedicate themselves to thorough on-farm observation of routine procedures to ensure the latest guidelines both are in place and being followed.

Veterinarian-Client-Patient Relationship

- ✓ **The facility has a written Veterinarian-Client-Patient Relationship (VCPR) that is signed by the farm owner and Veterinarian of Record (VOR) annually within the previous 12 months.**

A robust relationship between the dairy producer and farm veterinarian is crucial to ensuring animal care. The VCPR is one of the cornerstones of the FARM Animal Care Program.

As part of the FARM Animal Care Program, veterinarians are to sign a VCPR annually to document their involvement and formalize the relationship. These VCPR guidelines serve as the expectations of responsibility related to animal care for both the producer and veterinarian.

Farm visits and evaluation of treatment records are an important component of a valid VCPR. Proactively, veterinarians should work alongside producers to develop Herd Health Plans for all age groups of animals to prevent illness and injury.

There are many facets to a comprehensive VCPR. The American Association of Bovine Practitioners (AABP) identifies the following areas that are critical components for establishing and maintaining a VCPR.

Maintain Written Agreements for Working Relationships

- A veterinary practice or individual should establish a written agreement with the client that identifies the farm veterinarian who is accountable for drug use and treatments administered to the cattle on the farm operation.
- If more than one veterinarian or veterinary practice has a working relationship on the operation, then the agreement should establish which one has the overall responsibility for treatment protocols, drug inventories, prescriptions, personnel training, oversight and drug use on the operation.
- The identified veterinarian is referred to as the Veterinarian of Record.

Have a Veterinarian of Record (VOR)

- The VOR is the responsible party for providing appropriate oversight of drug use on the farm operation. Such oversight is a critical component of establishing, maintaining and validating a VCPR.
- This oversight should include, but may not be limited to, establishment of treatment protocols, training of personnel, review of treatment records, monitoring of drug inventories and assuring appropriate labeling of drugs. Veterinary oversight of drug use should include all drugs used on the farm regardless of the distribution of the drugs to the farm.
- Regular farm visits are an essential component to providing such oversight, however this can be supplemented through laboratory data evaluation, records evaluation, and communication via phone, email, text or other routine forms of communication. The timeliness of farm visits should be determined by the VOR based on the type and size of the operation.

Clarify any and all relationships with consultants and other veterinarians

- If a veterinarian who is not the VOR provides professional services in any type of consultative or advisory capacity, then it is incumbent on that veterinarian to ensure that the VOR is contacted and informed of their findings and recommendations.
- No protocols or procedures that have been established by the VOR should be changed unless or until there is an agreement by all parties about such changes. The agreement between the VOR and the client should establish which management groups of the farm operation are covered in the agreement. For instance, reproduction, milk quality, youngstock/replacement, feedlot, cow-calf and sick animal treatments are possible identifiable areas.

Provide written protocols

- Protocols and treatment guidelines for commonly occurring, easily recognizable conditions should be established in writing and agreed upon by all parties involved, and signed and dated.
- Training of personnel authorized to use drugs on the operation should be undertaken and periodically reviewed. The frequency of such training and review should be determined by the size and type of the operation, the rate of personnel turnover, and the changes in protocols and procedures.
- The treatment protocols and procedures should include all drugs used on the operation (over-the-counter, prescription, extra-label, Veterinary Feed Directive and water soluble). All protocols should clearly define when to quit treating and seek professional help (poor response, increase in severity of signs, etc.).

Ensure written or electronic treatment records are maintained

- Written/electronic treatment records of all animals or groups of animals treated are an essential component of maintaining and establishing the VCPR and decreasing the risk of violative drug residues. Such records should include, at a minimum:
 - Date of treatment
 - Animal treated identification
 - Name of treatment used
 - Disease/condition being treated
 - Dosage administered
 - Route of administration
 - Duration of the treatment
 - Specified withdrawal times for milk and meat to ensure food safety

Periodic and timely review of the treatment records, drug inventories and usage is an important part of oversight by the VOR.

Provide drugs or prescriptions for specific timeframes and for specific protocols

- Provision of drugs or drug prescriptions should be for specific timeframes appropriate to the scope and type of operation involved and only for the management groups within the operation over which the VOR has direct involvement and oversight. Additionally, failure to follow agreed upon protocols and procedures should be grounds for denial of provision of drugs or prescriptions except for an individual patient needing treatment at the time of examination.
- Routine examination of drug inventories on farm and product purchase records review (pricing information is unnecessary) are recommended. Cooperation with distributors is encouraged.
- Establishment of a VCPR for the sole purpose of the sale of drugs or increased sales of a brand of drug is not a valid or ethical reason for having a VCPR.

Dairy producers are encouraged to consult and review treatment protocols and antibiotic

Food Armor offers an online learning platform to advance skills and knowledge around antimicrobial stewardship practices. Through a self-paced program, Food Armor comprehensively guides learners through developing the habits and tools to empower themselves and their on-farm teams. These courses are designed specifically for the veterinarian and producer audiences and offer a practical framework for implementing antimicrobial stewardship plans on farms.

stewardship principles or programs with their veterinarians, including the American Association of Bovine Practitioners “[Guidelines for Establishing and Maintaining the VCPR in Bovine Practice](#),” the [National Dairy FARM Program Milk and Dairy Beef Drug Residue Prevention Manual](#) and [Food Armor](#).

It is understood that a veterinarian may develop an area of animal health management expertise and may serve as the primary veterinarian for one specific part of a dairy farm. For example, there may be one primary veterinarian for reproduction protocols and another primary veterinarian for metabolic issues. Dairy producers should ensure that any veterinarian providing prescription medication or protocols for their use on a farm notify the designated VOR for that farm.

✓ **The written Herd Health Plan is reviewed annually by the Veterinarian of Record (VOR).**

Written protocols and procedures should provide enough detail to ensure that all family and non-family employees with animal care responsibilities can routinely and consistently perform their animal care duties. As a best practice, written protocols are reviewed at least annually and updated as necessary with the VOR.

A comprehensive Herd Health Plan that meets all outlined FARM Animal Care Program standards should include written protocols for the following management areas:

- **Pre-Weaned Calf Management**
- **Non-Ambulatory Animal Management**
- **Euthanasia**
- **Fitness to Transport**
- Treatment of Common Diseases
 - Mastitis
 - Metritis
 - Milk Fever
 - Ketosis
 - Displaced Abomasum
 - Pneumonia
 - Diarrhea
- Vaccinations
- Milking Procedures
- Lameness Prevention and Treatment
- Difficult Calvings
- Biosecurity
- Fly Control
- Parasite Control
- Pest Control
- Branding (if conducted)
- Castration (if conducted)

These animal care standards, if unmet at the time of an evaluation, will generate a Mandatory Corrective Action Plan (MCAP).

Fillable written protocol templates are available from the [FARM Program and Food Armor](#). Other protocols that meet the same content requirements as the templates are acceptable.

✓ **The facility has permanent (written or electronic) treatment records for the treatment of the facility's common diseases that include:**

- Date of treatment
- Animal treated identification
- Name of treatment used
- Disease/condition being treated
- Dosage administered
- Route of administration
- Duration of the treatment
- Specified withdrawal times for milk and meat to ensure food safety

The connection between keeping adequate drug treatment records for food-producing animals may not be obvious, but good control measures can help keep unsafe food from reaching consumers.

Keeping drug records can:

- Prevent an accidental violative residue
- Ensure an effective Herd Health Plan
- Improve your effectiveness as a veterinarian
- Reduce liability (drug records are required by law)
- Save money

Veterinarians must maintain written or electronic records for all animals treated for at least 2 years (or as otherwise mandated by federal or state law), to document that the drugs were supplied to clients in line with federal and state rules and policies. This allows for the veterinarian to have a history to which he/she can refer to prescribe effective therapy and to serve as protection in case of regulatory follow-up.

Producers should also keep written or electronic records on all animals treated with drugs for at least 2 years per the Food and Drug Administration regulatory requirements. The records system should be easily accessible to everyone who works with the animals.

Please visit www.nationaldairyfarm.com for free record-keeping and drug management record forms:

- Veterinarian-Client-Patient Relationship (VCPR) Form
- Recommended or Approved Drug List
- Sample Animal Treatment Plan
- Beginning Drug Inventory
- Record of Drug Purchases
- Daily Treatment Record
- Drug Disposal Record
- Considerations for Culling Poster
- Draft Herd Health Plan

8-STEP PLAN FOR SOUND RECORD KEEPING

Step 1: Recommended or Approved Drug List

Early in your discussion with your herd health veterinarian make a narrow list of drugs to be used on your dairy. The intent is to reduce the scope of drugs used. A short list will permit you to focus your knowledge and will help to prevent an accidental violation of antibiotic residue laws.

Step 2: Animal Treatment Plan

When practicing preventive medicine or treating early symptoms of a disease or infection, it is important to be consistent. The second step is to establish a treatment plan for your herd health practices. Review with your herd health veterinarian and document protocols through the Herd Health Plan.

Step 3: Beginning Inventory

You and your herd health veterinarian should discard all old drugs and all drugs not on your approved drug list (Step 1), then annually inventory the remaining drugs and other appropriate information.

Step 4: Record Medicated Feed Purchases

Accidental antibiotic residues can occur from feeding practices as well as injections or other medical treatments. Be sure to clean feed equipment between batches. Avoid feeding leftover feed from feeder calves, hogs, etc., to lactating dairy cattle.

Step 5: Record of Drug Purchases

Promptly record every purchase of drugs the day they are purchased. The FDA requires a paper trail of all drugs used on the dairy.

Step 6: Daily Treatment Records

Milking and the sale of market cows will bring your Daily Treatment Record into use. Properly identify treated cows. Develop good habits to properly manage antibiotics.

Step 7: Monthly Economic Comparison

Every month you should review the investment you are making in each cow in the milking string. Compare your expenses by using the Daily Treatment Records.

Step 8: Disposal

Periodic review of drugs in storage will mean you occasionally throw away drugs that have expired. By recording your daily animal treatments and any discarded drugs, a paper trail of what has happened to all drugs purchased is generated. This 8-step antibiotic management system may prevent you from incurring a costly and embarrassing antibiotic accident!

Chapter 3: Continuing Education

Management Checklist

- ✓ All family and non-family employees with animal care responsibilities must sign a Cow Care Agreement annually.
 - ✓ All family and non-family employees with animal care responsibilities are trained annually in proper stockmanship.
 - ✓ Family and non-family employees with pre-weaned calf management responsibilities have been trained annually on the written protocol for pre-weaned calf management.
 - ✓ Family and non-family employees with non-ambulatory animal management responsibilities have been trained annually on the written protocol for non-ambulatory animal management.
 - ✓ Family and non-family employees with euthanasia responsibilities have been trained annually on written protocol for euthanasia.
 - ✓ Family and non-family employees with determining fitness to transport responsibilities have been trained annual on written protocol for fitness to transport.
-

“Family” Defined

An immediate family member is defined as grandparent, parent, in-law, spouse, partner, sibling, child or grandchild of the legal owner(s) of the dairy operation.

National Dairy FARM Animal Care Continuing Education Standards are valid for all family and non-family labor with animal care responsibilities in the respective areas over the age of 18 years.

All non-family labor must have individualized documentation.

- ✓ **All family and non-family employees with animal care responsibilities must sign a Cow Care Agreement annually.**

Humane handling and animal care should be part of the daily culture on the dairy and not just an annual training. Humane animal handling and animal care expectations should be reinforced throughout job expectations and daily functions. Animal abuse is never tolerated.

Continuing education and training allow farm workers the opportunity to increase their knowledge and skill, which in turn makes them a more valuable to the farm. No matter the size of the dairy, providing continuing education opportunities and training family and non-family employees who have animal care responsibilities ensures not only that the basics of low-stress animal handling and a zero-tolerance for abuse are understood, but also clearly conveys job expectations and establishes the dairy's culture.

Continuing education or training should encompass care expectations for particular circumstances, such as how to move cattle or what to do in cases of emergencies, as well as general expectations, such as how to implement a specific protocol.

Anytime farm workers are given opportunities to broaden their knowledge and increase their skill level, they are more engaged and more productive. Training and continuing education also allow a farm to hire entry-level workers and train them for the jobs for which they are needed, rather than trying to find workers that already have the needed skills and experience, which can be a challenge in communities with a limited labor pool. In short, training and developing workers is good for business and helps dairies remain competitive while dealing with a shortage of skilled, qualified workers.

Stockmanship

When handling dairy animals, the animals' comfort and safety, as well as the animal caretaker's safety, are the primary concerns. Animal caretakers should be trained or provided continuing education opportunities to learn proper handling techniques and appropriate use of restraint equipment. **Abuse is never tolerated.**

In best practice, animals are handled by equipment appropriate for the procedure. Use of flags, plastic paddles and a stick with ribbon attached to it is appropriate for expanding the handler's presence but should not come in direct contact with the animal. **Excessive or routine aggressive contact, slapping or prodding indicates an underlying problem that requires management attention and correction.** In all cases, use the least amount of force necessary to control the animal and still ensure the safety of herd mates and animal caretakers.

All equipment used to restrain cattle and all cattle housing areas should have provisions for the humane release and removal of cattle that go down or are otherwise in distress. Preferably, use equipment with emergency release devices.²

Routine contact with humans from birth, including regular gentle handling, will reduce fear and flight distance, make observation and treatment easier, improve productivity and enhance animal care. Cattle should be moved at a slow walk. It is particularly important to control the herd's speed in lanes and alleyways to prevent crowding at corners, gates and other narrow places in a facility.

Family Employees Continuing Education Criteria

On facilities with family employees, the option exists for one family member to be accountable for and sign one Cow Care Agreement on behalf of all family employees. Similarly, one family member can document and sign to confirm that other immediate family members (18 years and older) have been trained or provided continuing education in each required area.

In addition to these guidelines, the tail must never be used aggressively to move a cow. Tails can be broken through twisting, jacking or other rough handling and therefore this animal observation is set to detect farm-wide problems in animal handling. The widespread presence of broken tails indicates that there is or has been a problem on the farm. It is useful to investigate patterns in tail breaks, considering the age class affected, the location of the breaks within the tail, and observing handling to determine when and how tails may be broken.

Noise

Loud noises are known to be unpleasant for cattle, so every effort should be made to minimize loud noises during routine management practices such as handling, milking and transport. In best practice, care is taken to minimize noise of all types, including that from equipment and personnel. Dairy cows do not respond positively to excessive noise or yelling. Animal handlers should take care to minimize such behavior and treat animals—and other employees—with respect.

- ✓ **All family and non-family employees with animal care responsibilities are trained annually in proper stockmanship**
- ✓ **Family and non-family employees with pre-weaned calf management responsibilities have been trained annually on written protocol for pre-weaned calf management. (See Chapter 7)**
- ✓ **Family and non-family employees with non-ambulatory animal management responsibilities have been trained annually on written protocol for non-ambulatory animal management. (See Chapter 8)**
- ✓ **Family and non-family employees with euthanasia responsibilities have been trained annually on written protocol for euthanasia. (See Chapter 9)**
- ✓ **Family and non-family employees with determining fitness to transport responsibilities have been trained annually on written protocol for fitness to transport. (See Chapter 10)**

Types of Continuing Education

Continuing education can be facilitated through a variety of methods. The following is a non-exhaustive list of opportunities and programs that can be used for annual continuing education and training:

- Discussions or presentations from on-farm dairy industry stakeholder specialists
 - Veterinarians
 - Nutritionists
 - Technical service teams (pharmaceutical, reproduction, milk quality, etc.)
 - University and Extension faculty and staff
 - Beef Quality Assurance State Coordinators
- Attendance of dairy industry meetings
- Formal dairy employee training programs
- Job shadowing with management

- Example: A new milker has been hired and he job shadows milker shift supervisor for a period of time. Management confirms with milker shift supervisor that the new employee is appropriately trained and can begin milking independently.
- Formal education
 - Example: Animal husbandry class at university/college
 - Continuing education class offering by dairy industry led program i.e. U.S. Dairy Education and Training Consortium, Penn State Online Dairy Production and Management
- Print and digital media training
 - Example: FARM has a stockmanship training video available in the resources section of the website. Employees, over lunch break, watch the video in 5-10 minute segments throughout the month.
 - Example: A new calf feeder has been hired for weekend feedings. There is a new article in Dairy Herd Management on proper feeding techniques and nutritional requirements that she reads and demonstrates to management that the process is fully understood.

A list of training aids and resources can be found on the National Dairy FARM Program website at www.nationaldairyfarm.com.



FARM encourages dairy producers to implement the [See it? Stop it!](#) program.

See it? Stop it! is a national initiative that confirms the culture of care that farm owners and managers demand of every person who comes in contact with their animals. The purpose is to:

- Highlight the integrity of the farm's philosophies on responsible animal care
- Help staff understand their important role in animal protection
- Provide clear direction to employees who suspect or witness deliberate animal abuse, neglect, harm or mishandling on how to immediately report it to a supervisor or other individual responsible for enforcement of proper animal care

Materials, both in English and Spanish, include a program overview, initiative values, poster, brochure, PowerPoint presentation and employee agreement and checklist. See it? Stop it! helps producers confirm their obligation to great animal care and their commitment to ensure those in contact with their animals do the same.

Chapter 4: Facility Management

Management Checklist

- ✓ All age classes of animals have access to clean water appropriate for climatic conditions.
- ✓ All age classes of animals have access to sufficient quantities of feed for maintenance, health and growth.
- ✓ All age classes of animals are protected from heat and cold for typical climatic conditions.
- ✓ All age classes of animals have housing that allows for the ability to easily stand up, lie down, adopt normal resting postures and have visual contact with other cattle without risk of injury.
- ✓ All age classes of animals have a resting area that is clean, dry, provides traction at all times when away from the milking facility and does not pose risk of injury.
- ✓ All age classes of animals have a method of daily exercise (weather permitting, if outdoors)

Facility Design:

- ✓ Facilities are designed to prevent injuries, slips and falls of animals.
- ✓ Facilities are designed to prevent unnecessary contact with electrical currents.
- ✓ Facilities are designed to have adequate lighting for animal observation and family and non-family employees with animal care responsibilities safety.
- ✓ Facilities are designed to provide proper ventilation in all housing facilities that reduces odors, dust and/or noxious gas.
- ✓ The facility has names, telephone numbers and the site address posted in a prominent location, in the languages understood by family and non-family employees with animal care responsibilities, for emergency preparedness.
- ✓ The facility has a written Emergency Action/Crisis Plan to effectively manage emergencies or crises that may occur.

Proper management of cattle housing environments has been linked to improved animal performance and overall animal well-being. Facilities include all housing structures, handling structures, lots, pens, stalls, alleys and pastures that are inhabited by cattle of any age.

Feed and Water

- ✓ **All age classes of animals have access to clean water appropriate for climatic conditions.**
- ✓ **All age classes of animals have access to sufficient quantities of feed for maintenance, health and growth.**

Nutritional management is key to excellent animal health. All animals should have access to adequate feed and water on a daily basis and in a consistent manner, according to their specific requirements. Rations should provide the required nutrients for maintenance, growth, stage of lactation, health and pregnancy based on an animal's life stage. Body condition scoring is a valuable outcomes-based measure that can be used to monitor the nutritional condition of the herd.

Water

Fresh, clean water is essential for the health and well-being of the animals. Access to waterers – large tanks, troughs, buckets or fountains – is essential for cattle to satisfy their need for water. Waterers should be convenient to access for the animals to reach on demand, and waterers (number, size and capacity) should accommodate the number of animals in the group.

Continuous access to water is best practice. However, when continuous access is not possible (i.e. in freezing climatic conditions), water should be made available to allow animals to drink to satiation at least twice per day. See Table 1 for the estimated water consumption requirements of dairy cattle.

Additional considerations for water include:

- Locating waterers near feed troughs and near stalls
- Monitoring and maintaining water cleanliness through routine cleaning
- Providing access to water in return alleys from the milking parlor to promote consumption immediately after milking

Table 1. Estimated Water Consumption of Dairy Cattle

| ESTIMATED DAILY WATER CONSUMPTION FOR A 1,500-POUND LACTATING COW PRODUCING 40 TO 100 POUNDS OF MILK DAILY. ^a | | | | | | |
|---|----------------------------------|---------------------------------------|------|------|------|------|
| Milk Production (lbs/day) | Estimated DM Intake (lbs/day) | Mean Minimum Temperature ^b | | | | |
| | | GALLONS PER DAY ^c | | | | |
| | | 40°F | 50°F | 60°F | 70°F | 80°F |
| 40 | 42 | 18.4 | 20.2 | 22.0 | 23.7 | 25.5 |
| 60 | 48 | 21.8 | 23.5 | 25.3 | 27.1 | 28.9 |
| 80 | 54 | 25.1 | 26.9 | 28.7 | 30.4 | 32.2 |
| 100 | 60 | 28.5 | 30.3 | 32.1 | 33.8 | 35.6 |

^aSodium intake = 0.18% of DM intake • ^bMean minimum temperature typically is 10 to 15°F lower than the mean daytime temperature • ^c1 gallon of water weighs 8.32 pounds.

Feed

As a best practice for animal health, feed quality and nutrient content of feed components should be monitored routinely.

By working with a dairy nutritionist, a dairy operation can evaluate its feeding program to ensure it meets the basic nutritional requirements for the animals' maintenance, growth, production, health and reproduction. Qualified dairy nutritionists can assist in formulating rations that economically meet nutritional requirements of animals along with the following services for a facility:

- Check that feed and feed ingredients are carefully mixed and formulated according to the animals' dietary needs using dairy nutrition models
- Adjust rations to assure the correct content of protein, energy, fiber, macro-minerals and micronutrients in feed whenever forages are changed
- Periodically assess dry matter intake
- Adjust diets to provide for production level
- If conditions warrant, check homegrown or purchased feed ingredients and commodities for nitrates, mycotoxins and other soil or climate-induced problems
- Check feed quality to see if it matches the manufacturer's statement

Feed Management

Feed should be provided to animals on a continuous basis through delivering new feed several times daily or replenishing through a push-up process.

The daily removal of feeds not consumed ensures freshness of feed, prevents mold and spoilage and aids in insect control. This is a particularly important practice when high-moisture feeds such as silage are used. A smooth feeding surface will facilitate cleaning and routine sanitation of eating areas is enhanced through daily removal of refused feed.

Additionally, safely storing bulk supplies of feed in appropriately designed areas will help avoid moisture, vermin and bacterial or fungal contamination and will help assure maintenance of feed quality and safety. As a best practice, **medicated feeds are stored separately and are properly labeled**. Store toxic compounds outside of the feed storage area and outside of the animals' resting area.

Mycotoxins are secondary fungal metabolites that are toxic to animals and humans. Mycotoxin-producing molds are ubiquitous in nature and thus mycotoxin contamination of feeds is a potential consequence of normal mold plant interactions. Economic losses associated with mycotoxicoses include reduced milk production, poor fertility, potential contaminated milk and increased disease susceptibility.

Protection from Heat and Cold

- ✓ **All age classes of animals are protected from heat and cold for typical climatic conditions.**

Environmental temperature affects an animal's thermal comfort, which in turn, affects an animal's behavior, metabolism and performance. The temperature that the animal experiences and the effect on the animal is the net result of air temperature, humidity, air movement, shade, insulating effects of the surroundings and the animal herself.

The Thermoneutral Zone (TNZ) is the range of temperatures between which the animal does not need to expend energy to stay warm or to cool. The TNZ for newborn calves is 50° - 78° F; for month-old calves and adult cattle it typically is 32° -73° F. With the exception of newborn calves, cattle are quite cold tolerant. However, compared to humans, cattle become heat stressed at lower temperatures. In order to account for the impact of both temperature extremes and relative humidity, the best practice is to use the Temperature Humidity Index (THI) and begin heat abatement measures at a THI of 65°- 72°. Cold abatement should be provided promptly for calves starting at a THI below 50° and for adult cattle below 32°.

Heat Abatement

Monitoring cows' respiratory rates is the best way to determine if they are under heat stress.

If 8 of 10 cows have respiratory rates of 60 beats per minute (BPM) or above, the group is suffering from heat stress.

Mild to moderate heat stress occurs when respiration rate exceeds 75-85 BPM and rectal temperature exceeds 102.2° F-104° F (38-40° C).

A cow in severe stress has a respiration rate between 120 and 140 BMP and a rectal temperature exceeding 106° F (41 C).

At each of these stages, milk yield losses are experienced and reproductive losses are detectable. Under conditions of heat stress, producers should provide heat stress mitigation strategies. These strategies may include:

Drinking water

Cattle must have sufficient access to water to meet their intake needs under conditions of heat stress, which may exceed 30 gallons per cow per day for high-yielding cattle. Recommendations based on best practice suggest that under housed conditions at least 2 waterers are recommended per group with at least 2 inches of accessible trough perimeter per adult cow. Water troughs must also refill quickly enough for animals to be able to drink. To be sufficient, the water flow should be at least 2.6 gallons/min for a bowl and 5 to 7 gallons/min in case of a trough.

Shade

Cattle prefer and appear motivated to use shade and will readily do so when solar radiation increases.⁴ A best practice is for all animals to have access to shade that allows simultaneous use by the entire group to minimize competition.

Air Movement

Air movement speeds of 200-400 ft. per minute are ideal for optimal cooling⁶. Mechanical ventilation systems such as tunnel and cross ventilation, and use of supplemental recirculation fans in holding areas and pens and under shades are recommended to supply this fast-moving air.

Soaking and Misting

Water may be used to cool the air before it reaches the cow, such as in evaporative cooling pad systems. Water may also be used to enhance evaporative cooling by soaking the cow herself, often coupled with the application of fast-moving air over her skin. The parlor holding area is a priority area for cooling on the majority of dairy farms.

Cold Abatement

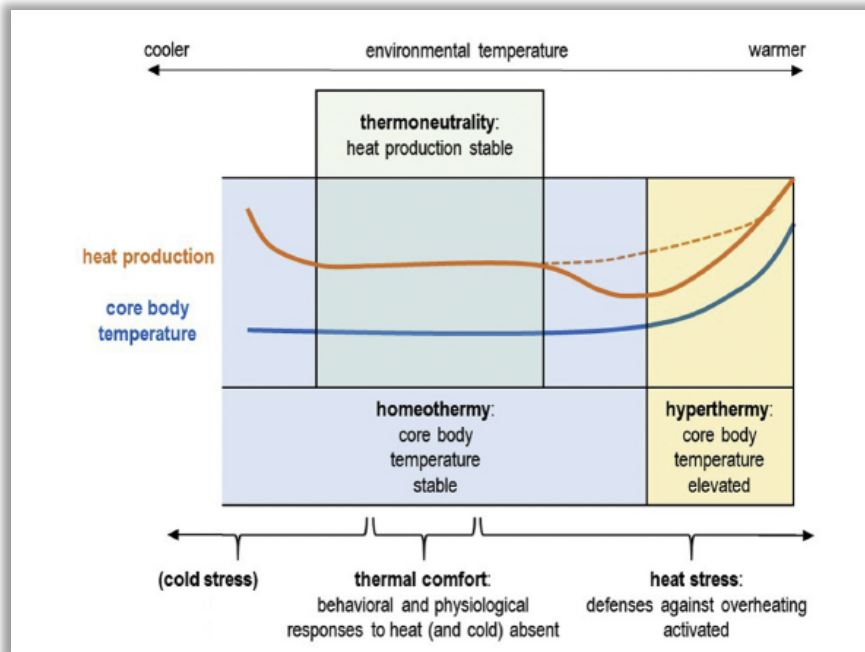
When facing cold conditions, cattle, and in particular calves, should be provided with adequate feed to maintain body condition along with protection from wind and moisture. Cold abatement strategies may also include:

- Curtains
- Windbreaks



- Barns/Sheds
- Additional Bedding

In the case of the newborn calf, under one month of age, it is important to shield the calf from drafts, which typically are defined as air speeds of more than 50 feet per minute. Provision of dry bedding is preferred by the pre-weaned calf⁷ and is essential in cold weather climates. Higher milk feeding rates should also be considered to supplement calories for growing calves⁸ and a deep bed of straw is recommended for “nesting.” Clean calf jackets may also be used as a supplement to these strategies.



Source: “Considerations for Cooling Dairy Cows with Water” Jennifer M.C. Van Os, PhD

Housing

- ✓ **All age classes of animals have housing that allows for the ability to easily stand up, lie down, adopt normal resting postures and have visual contact with other cattle without risk of injury.**
- ✓ **All age classes of animals have a resting area that is clean, dry, provides traction at all times when away from the milking facility and does not pose risk of injury.**
- ✓ **All age classes of animals have a method of daily exercise (weather permitting, if outdoors).**

At all ages, in best practice, cattle should be able to stand up, lie down and adopt normal resting postures within a given housing system. Factors that can affect these behaviors include the lying surface, size and configuration of the lying area.

Dairy cattle are highly motivated to spend time lying down and have been shown to reduce feeding time in order to secure a lying space. It is therefore important to provide a resting area that is clean, dry, provides traction at all times when away from the milking facility and does not pose risk of injury.

Lying Area

Cattle have increased lying time in well-bedded environments, which also reduces the risk for lameness. The most important indicator of an insufficient lying surface is the presence of hock injuries. Cows kept on deep, loosely bedded stalls of sand or dried manure solids, for instance, consistently have fewer hock injuries than those kept on sparsely bedded surfaces. In addition, appropriate bedding materials and manure removal helps control mastitis. Bedding should be smoothed and groomed as often as is necessary to keep the surface clean, soft and dry. Regardless of lying area surface, lack of adequate bedding reduces lying time and increases the risk of lameness and injuries.

Bedding should also be dry in best practice. A number of research studies provide strong evidence that cattle spend less time lying down in wet bedding or mud and will avoid wet surfaces if given a choice. Dryness is also important for bedding to provide insulating properties. This is particularly important for young calves in cooler weather. Dairy calves also show a clear preference for drier bedding and aversion to concrete lying surfaces, indicating that access to dry bedding is also important for growing calves.

The lying area should be 1-to-2 feet higher than the pen surface and located under the pen shades, if used. If cattle cooling systems are used under the shade, daily grooming is necessary. A best practice is to provide bedding under the shade during extreme cold or wet conditions. Current recommendations for freestall design and space provision for heifers and mature cows are provided in Tables 2 and 3.

Stall Considerations

Social Environment

Cattle are herd animals. Socially isolated cattle show signs of stress:

- Increased heart rate
- Vocalization
- Defecation/urination
- Heightened cortisol levels.

As a best practice, isolation is minimized and at least visual contact with other animals maintained, the only exception being when cows approach calving.

Stall dimensions should always be considered relative to the size of the animals that will use them, genetic improvements and their effect on size of future herd members, as well as the behavior of cattle when using stalls. There should exist sufficient space for each animal to lie down without disturbance from neighbors, and stalls should be designed to allow for the normal rising and lying movements of the cow. Unobstructed lunge space is essential to allow cattle to complete the normal rising movement.

Longer stalls improve leg health and cows spend more time lying down in wider stalls. Stall dimensions (stall width, brisket boards, neck rail placement) and tie-stall chain length should be set to maximize cow comfort and use of the lying area.

Tie-stall design features should not keep the stall clean by preventing cows from using the stall for lying and standing. Less restrictive neck rails that are further from the curb and higher allow for the cow to move fully into the stall and have been shown to reduce lameness.

Space Allowance

In loose housing systems, increased cow density in the pen increases competition among cows for access to feed, stalls and water. Cattle management must accommodate these challenges so that all animals within a pen receive adequate nutrition and water without competitive pressure. In best practice, all animals have access to a sanitary and comfortable place to rest and eat at any given time.

The implications of overstocking barns are complex. In studies where only the number of freestalls are changed and feeding space is held constant, lying time is always reduced when there are fewer stalls than cows. However, on farms where stocking density affects both the number of stalls available and feeding space, overstocking is not an important predictor of lying time but does increase feeding rate.

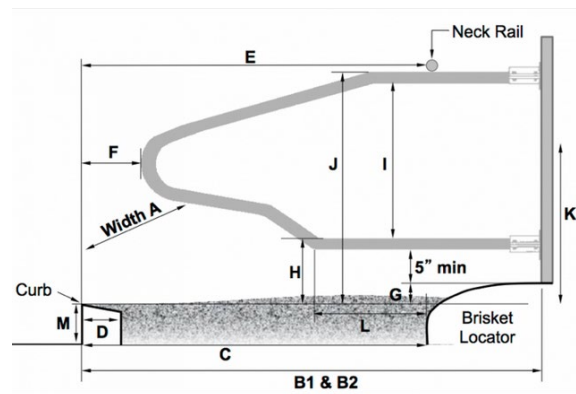
The following tables and images provide recommended guidance for space requirements of animals in various housing systems:

Table 2. Recommendations for lying space requirements by estimated body weight for bedded pack housing of adult cows.

ADULT COWS

| Stall Dimensions (inches) | Body Weight Estimate (lbs) | | | | | |
|--|----------------------------|-------|-------|-------|-------|-------|
| | 1000 | 1200 | 1400 | 1600 | 1800 | 2000 |
| Center-to-center stall divider placement (stall width) (A) | 42 | 45 | 48 | 50 | 54 | 57 |
| Total stall length facing a wall (B1) | 96 | 108 | 108 | 120 | 120 | 126 |
| Outside curb to outside curb distance for head-to-head platform (B2) | 180 | 192 | 192 | 204 | 204 | 216 |
| Distance from rear curb to rear of brisket locator (C) | 64 | 66 | 68 | 70 | 72 | 75 |
| Width of rear curb (D) | 6-8 | 6-8 | 6-8 | 6-8 | 6-8 | 6-8 |
| Horizontal distance between rear edge of neck rail and rear edge of curb for mattress stalls (E) | 64 | 66 | 68 | 70 | 72 | 75 |
| Horizontal distance between rear edge of neck rail and rear edge of curb for deep bedded stalls (E)* | 58 | 60 | 62 | 64 | 66 | 69 |
| Distance from rear edge of divider loop to point of curb (F) | 9 | 9 | 9 | 9 | 9 | 9 |
| Height of brisket locator above top of curb (loose bedded stall or mat/mattress surface) (G) | 3 | 3 | 4 | 4 | 4 | 4 |
| Height of upper edge of bottom stall divider rail above top of curb (loose bedded stall or mat/mattress surface) (H) | 10 | 10 | 12 | 12 | 13 | 14 |
| Interior diameter of the stall divider loop (I) | 30 | 33 | 33 | 36 | 36 | 36 |
| Height of neck rail above top of curb (loose bedded stall or mat/mattress surface) (J) | 42 | 45 | 48 | 50 | 52 | 54 |
| Obstruction height (K) | 5-35 | 5-35 | 5-35 | 5-35 | 5-35 | 5-35 |
| Horizontal distance from brisket locator to loop angle (L) | 20-22 | 20-22 | 20-22 | 20-22 | 20-22 | 20-22 |
| Rear curb height (M) | 8 | 8 | 8 | 8 | 8 | 8 |

From the Dairyland Initiative <https://thedairylandinitiative.vetmed.wisc.edu/>



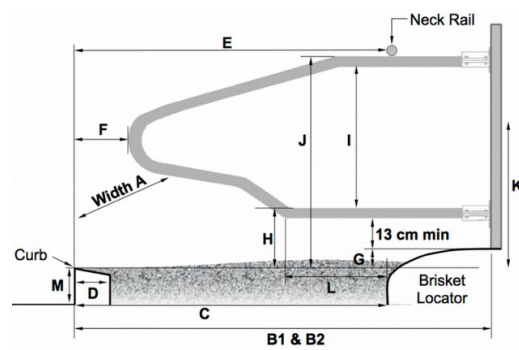
From the Dairyland Initiative <https://thedairylandinitiative.vetmed.wisc.edu/>

Table 3. Recommendations for lying space requirements by estimated body weight for bedded pack housing of heifers.

HEIFERS

| Stall Dimensions (cm) | Body Weight Estimate (kg) | | | | | |
|--|---------------------------|-------|-------|-------|-------|-------|
| | 450 | 550 | 640 | 730 | 820 | 910 |
| Center-to-center stall divider placement (stall width) (A) | 107 | 114 | 122 | 127 | 137 | 145 |
| Total stall length facing a wall (B1) | 244 | 274 | 274 | 305 | 305 | 320 |
| Outside curb to outside curb distance for head-to-head platform (B2) | 457 | 488 | 488 | 518 | 518 | 549 |
| Distance from rear curb to rear of brisket locator (C) | 163 | 168 | 173 | 178 | 183 | 191 |
| Width of rear curb (D) | 15-20 | 15-20 | 15-20 | 15-20 | 15-20 | 15-20 |
| Horizontal distance between rear edge of neck rail and rear edge of curb for mattress stalls (E) | 163 | 168 | 173 | 178 | 183 | 191 |
| Horizontal distance between rear edge of neck rail and rear edge of curb for deep bedded stalls (E)* | 147 | 152 | 157 | 163 | 168 | 175 |
| Distance from rear edge of divider loop to point of curb (F) | 23 | 23 | 23 | 23 | 23 | 23 |
| Height of brisket locator above top of curb (loose bedded stall or mat/mattress surface) (G) | 8 | 8 | 10 | 10 | 10 | 10 |
| Height of upper edge of bottom stall divider rail above top of curb (loose bedded stall or mat/mattress surface) (H) | 25 | 25 | 31 | 31 | 33 | 36 |
| Interior diameter of the stall divider loop (I) | 76 | 84 | 84 | 91 | 91 | 91 |
| Height of neck rail above top of curb (loose bedded stall or mat/mattress surface) (J) | 107 | 114 | 122 | 127 | 132 | 137 |
| Obstruction height (K) | 13-89 | 13-89 | 13-89 | 13-89 | 13-89 | 13-89 |
| Horizontal distance from brisket locator to loop angle (L) | 51-56 | 51-56 | 51-56 | 51-56 | 51-56 | 51-56 |
| Rear curb height (M) | 20 | 20 | 20 | 20 | 20 | 20 |

*E in deep, loose-bedded stalls is less than in mattress stalls to encourage cows to stand with rear feet in alley instead of on stall base. From the Dairyland Initiative <https://thedairylandinitiative.vetmed.wisc.edu/>



From the Dairyland Initiative <https://thedairylandinitiative.vetmed.wisc.edu/>

Exercise

Regardless of age, all animals should be in an environment where they're able to turn around or locomote each day.

Exercise for tied animals provides opportunities for grooming the back of the body, social grooming and walking/trotting. Controlled studies show that exercise may also improve hoof health.

The quality of the exercise area is important and, in best practice, minimizes any risk for injury. In best practice, tied cattle have daily exercise (weather permitting, if outdoors) and the quality of the area provided for this is clean, dry and of appropriate flooring material.

Facility Design

Flooring

- ✓ **Facilities are designed to prevent injuries, slips and falls of animals.**

Under best practice, concrete flooring surfaces should be appropriately grooved or textured to reduce the risk of animals slipping, which can result in injuries, and should be designed such that they do not cause injury. Skid-resistant surfaces reduce injuries and must retain their non-slip characteristic after cleaning, scraping or wear. High-traction, rubber flooring is desirable in areas of the facility where cows stand for prolonged periods (e.g. holding area), in transfer lanes to reduce hoof wear and in other areas to reduce the risk of slipping and injury. A plan should be in place to minimize the impact of seasonal changes that reduce traction, such as ice. It is essential that all maternity areas have high traction flooring given the increased number of standing bouts during labor.

Electrical

- ✓ **Facilities are designed to prevent unnecessary contact with electrical currents.**

Crowd gates, electrical fences and stall trainers are among the many sources of electrical currents on farm. Ensuring the proper functioning of equipment with electrical current reduces the chances of negative animal care and health events. These tools should also be regularly and appropriately adjusted, maintained and correctly located, so that cows are not subject to continuous electrical current. Stray voltage checks are also valuable as stray voltage can cause behavior changes and milk production loss.

Lighting

- ✓ **Facilities are designed to have adequate lighting for animal observation and family and non-family employees with animal care responsibilities safety.**

Lighting should allow inspection of animals by family and non-family employees and provide safe working conditions.

In facilities where animals are routinely observed or handled, such as for milking or estrus

observation, lighting should be evenly distributed. An outdoor light attached to a corral or building where animals congregate provides sufficient illumination for safety purposes.

Air Quality

- ✓ **Facilities are designed to provide proper ventilation in all housing facilities that reduces odors, dust and/or noxious gas.**

Adequate ventilation, be it natural or mechanical, helps prevent respiratory and other diseases by removing heat, microbes, water vapor, air pollutants and odors from an enclosed animal facility and replacing the contaminated air with fresh air. Ways to improve air quality are through manure management and good air movement provided by well-designed natural or mechanical ventilation systems.

Ventilation also modifies the indoor air temperature, so supplemental heating and cooling may be needed when temperature control is critical. Barns should be effectively designed to ventilate naturally or mechanically, with the aim of providing a minimum of 4 air changes per hour in the winter and 40-50 air changes per hour in the heat of the summer.

The risk of infection from airborne pathogens may be minimized by segregating or isolating animals with highly contagious diseases from the air space occupied by the rest of the group/herd, and by ensuring adequate ventilation rates. As a best practice, care is taken to ensure that the ventilation system does not move air from infected animals to an area occupied by healthy animals.

Emergency Preparedness

- ✓ **The facility has names, telephone numbers and the site address posted in a prominent location, in the languages understood by family and non-family employees with animal care responsibilities, for emergency preparedness.**

In case of an emergency, time is of the essence. Posting the names and telephone numbers of emergency contacts (e.g., herd manager, owner, veterinarian, site address and co-op/processor) in a prominent place in the animal facility in employees' native languages allows for enhancement of communications and response time. Emergencies can range from significant weather events to unexpected absences. It is advantageous to do routine walk-throughs of emergency action plans with all individuals designated so when an emergency occurs, everyone knows their respective roles and the emergency can be managed as intended.

- ✓ **The facility has a written Emergency Action/Crisis Plan to effectively manage emergencies or crises that may occur.**

A best practice includes arrangements for animal caretakers or temporary help to cover emergencies, weekends, holidays and unexpected absences of assigned animal caretakers. Animal caretakers are informed of animal care expectations and qualified to perform assigned duties.

Posting the names and telephone numbers of emergency contacts (e.g., herd manager, owner, veterinarian, site address, equipment dealers and power company) in a prominent place in the animal facility in employees' native languages is necessary to speed up communications in an emergency.

Emergency Action Plans should include:

- Identification of potential emergency situations
- The following components for each potential emergency situation:
 - Actions to take in an emergency situation
 - Designated people in charge of performing those actions
 - Individuals given authority to perform specific action when emergency occurs
 - Communication flow for quick and accurate information share
 - Data and information related to: site, utilities, evacuation routes, road conditions, equipment/ materials involved, injuries and locations of resources.
 - Emergency supplies and equipment
 - Training and documentation of the training on the execution of the emergency plan for all involved including employees and first responders
 - Response scenarios options
 - Sheltering in place

For additional information, review Comprehensive Emergency Action Plan Guidance in the [FARM Resource Library](#).

Chapter 5: Animal Management

Management Checklist

- ✓ Herd Health Plan & Protocols
 - All written protocols are translated into languages understood by family and non-family employees with animal care responsibilities.
 - The written Herd Health Plan includes an effective written protocol for treatment of the following common diseases:
 - Mastitis
 - Metritis
 - Metabolic diseases of milk fever, ketosis, and displaced abomasum (DA)

- Pneumonia, diarrhea and any additional routinely occurring diseases identified by the veterinarian
- The written Herd Health Plan includes an effective written protocol for vaccinations that specifies:
 - Age(s) when vaccination given
 - Product used
 - Dosage administered
 - Route of administration
 - Withdrawal times
- The written Herd Health Plan includes an effective written protocol for lameness prevention and treatment.
- The facility has an effective written protocol for milking procedures.
- The written Herd Health Plan includes an effective written protocol for managing difficult calvings (dystocia).
- The written Herd Health Plan includes an effective written protocol to manage pests.
- The written Herd Health Plan includes an effective written protocol to manage flies.
- The written Herd Health Plan includes an effective written protocol to manage parasites.
- The facility has an effective written protocol to manage biosecurity.
- ✓ Castration:
 - Bulls being raised as dairy steers are castrated at earliest age possible.
 - Pain mitigation for castration is provided in accordance to the signed protocol by the Veterinarian of Record.
 - The written Herd Health Plan includes an effective written protocol for castration.
- ✓ Branding:
 - Cattle are branded at the earliest age possible.
 - Pain mitigation for branding is provided in accordance with the signed protocol by the Veterinarian of Record.
 - The written Herd Health Plan includes an effective written protocol for branding.

Animal Management Observations

- ✓ Each animal is permanently identified.
- ✓ The facility complies with the ban on routine tail docking.

Outcomes-Based Animal Observations

- ✓ 99% or more of pre-weaned calves (>2 days old), post-weaned heifers and lactating cows observed have a body condition score of 2 or greater on FARM Body Condition Scorecard.
- ✓ 95% or more of lactating cows observed do not have broken tails.
- ✓ 90% percent or more of pre-weaned calves (>2 days old), post-weaned heifers, pre-fresh heifers/dry cows and lactating cows observed score 2 or less on the FARM Hygiene Scorecard.
- ✓ 95% or more of the lactating cows observed score 2 or less on the FARM Knee Scorecard.

- ✓ 95% or more of the lactating cows observed score 2 or less on the FARM Hock Scorecard.
 - ✓ 95% or more of the lactating cows observed score 2 or less on the FARM Locomotion Scorecard.
-

✓ **Herd Health Plan & Protocols**

- **All written protocols are translated into languages understood by family and non-family employees with animal care responsibilities.**

For job responsibilities to be performed as intended, a best practice is to use written protocols to train family and non-family employees. Written protocols should provide enough detail to ensure that family and non-family employees are empowered to implement their job responsibilities consistently and accurately. To ensure the best understanding of job expectations, protocols should be translated into languages understood by those with animal care responsibilities. Written protocols can utilize images or other learning tools to enhance the understanding of the content of a protocol.

- The written Herd Health Plan includes an effective written protocol for treatment of the following common diseases:
 - Mastitis
 - Metritis
 - metabolic diseases of milk fever, ketosis, displaced abomasum (DA)
 - Pneumonia, diarrhea and any additional routinely occurring diseases identified by the veterinarian.

An effective Herd Health Plan emphasized prevention, rapid diagnosis and quick decision making on necessary treatment of all sick animals. A licensed veterinarian should help dairy farmers develop and implement a Herd Health Plan.

- The written Herd Health Plan includes an effective written protocol for vaccinations that specifies:
 - Age(s) when vaccination given
 - Product used
 - Dosage administered
 - Route of administration
 - Withdrawal times

A very important component of antimicrobial stewardship is prevention of disease. Vaccinations can help prevent or reduce the effects of disease, which ultimately can decrease the need for antimicrobial therapy. The VOR is the ideal resource to assist the farm with developing a vaccination protocol. Such a protocol should include the type of vaccine used, storage, administration, timing/schedule and production classes that receive the vaccinations.

In general, a basic core vaccination program should be used on every farm to enhance immunity to disease. Further vaccination strategies can be implemented based on the veterinarian's knowledge of the disease history and risk for the specific farm operation.

- **The written Herd Health Plan includes an effective written protocol for lameness prevention and treatment.**

Lameness interferes with normal resting behavior, movement to and from the milking area, and feeding activity, limits the exhibition of estrus and influences general health. Lameness, caused by painful lesions to the limb or foot, compromises animal welfare. Because of this, lameness should be a management priority for all dairy herds. Foot lesions most commonly associated with lameness in dairy cattle include infectious diseases such as digital dermatitis (hairy heel wart) and foot rot, as well as non-infectious diseases that include white line lesions and sole ulcers.

Lameness may be reduced by:

- Routine surveillance for lame cows coupled with prompt, effective treatment
- Routine use of foot baths
- Improved flooring
- Providing adequate time for daily rest by minimizing time out of the pen to less than 3 hours per day
- Avoiding overstocking
- Maintaining thermal neutral zone
- Preventive hoof trimming

- **The facility has an effective written protocol for milking procedures.**

Ensuring appropriate animal handling at milking is important for both animal well-being and productivity. Numerous studies have found that farms with quiet, confident animal caretakers have higher milk production, thus all animal caretakers with milking responsibilities should behave in a calm and controlled manner throughout the milking process. Milkers should be trained to load cows into the parlor in accordance with the stockmanship principles outlined in Chapter 3.

Specifically:

- Cows should be moved without excessive vocal or physical interaction, resulting in calm movement in the parlor.
- Animal handlers should walk against the flow of cows coming into the parlor, paying attention to the reaction of the cattle and adjust for balking or stopping. To return to their starting positions, animal handlers should use a path that does not impede the flow of cattle movement.
- Gates and restraining equipment should operate smoothly, quietly and safely.

Ideally, the total time out of the pen for each milking should be less than 1 hour for the last cow milked. The pre-milking holding area on farms with a parlor is typically the place of highest animal density on the farm. It is important that prevention of injury as well as cow comfort and movement be considered in the design of the holding area's flooring, space, sidewalls and entrance to the milking parlor. Moderation of temperature extremes by use of fans, sprinklers or other technology ensures animal comfort in the holding areas and the milking parlor.

The preparation routine that signals the beginning of milking should be consistent and as low stress to the cow as possible. The routine should include checking for abnormal milk, and thorough cleaning and drying of the teats. Avoid medical examinations or unpleasant experiences from being associated with the place of milking.

Milking equipment should also be regularly maintained and checked for vacuum level, pulsation rate and pulsation ratio. To prevent disease transmission, milking equipment is maintained, cleaned and sanitized. Teat ends should be periodically inspected to facilitate timely identification of any problems.

- **The written Herd Health Plan includes an effective written protocol for difficult calvings (dystocia).**

Dystocia is a difficult birth typically requiring assistance from the animal caretaker. The facility must have a Herd Health Plan that includes an effective written protocol for difficult calvings that animal caretakers are trained to implement. The protocol should include items such as when to intervene and what is appropriate equipment to use when assisting an animal that is experiencing a difficult calving.

- **The written Herd Health Plan includes an effective written protocol for pest control.**
- **The written Herd Health Plan includes an effective written protocol to manage flies.**
- **The written Herd Health Plan includes an effective written protocol to manage parasites.**

Pest, parasite and fly control is part of a thorough herd health program because parasites, pests and flies transmit diseases and interfere with the animals' comfort.

In some regions, rabies and other diseases are spread to dairy animals by wildlife in addition to cats and dogs. Exercise caution to avoid contaminating feedstuffs when implementing pest control, as contaminants may pass into the animals' bodies and milk. A certified pesticide applicator or a pesticide service may be used. Read and follow label directions for all pesticide products.

- **The facility has an effective written protocol for biosecurity.**

Implementing a biosecurity protocol helps prevent exposing cattle to diseases that may be transmitted from other animals, humans, vehicles or additional external sources. Sound biosecurity protocols allow for a dairy operation to maintain business continuity and animal health and well-being. Items to consider in developing a biosecurity protocol may include biosecurity processes around:

- Cleaning and disinfection

- Vehicles and equipment
- Personnel
- Animal movement
- Product movement
- Carcass disposal
- Manure management
- Parasite, pest and fly control
- Feed

✓ **Castration**

- Bulls being raised as dairy steers are castrated at earliest age possible.
- Pain mitigation for castration is provided in accordance to the signed protocol by the Veterinarian of Record.
- The written Herd Health Plan includes an effective written protocol for castration.

Castration is performed to stop the production of male hormones and semen to prevent unwanted mating. In addition, castration produces cattle that are less aggressive and easier to handle, which promotes animal and human safety. Bulls being raised as dairy steers should be castrated at the earliest age possible.

There is scientific evidence that castration is acutely painful regardless of the method used⁹;

While obstacles to immediate implementation exist, research suggests that application of local analgesics have the potential to minimize or eliminate pain and stress associated with castration.

The most common methods of castration are surgical, banding and Burdizzo (physical crushing of the cord). Consult with your veterinarian to determine the best choice of castration and pain management procedures for your cattle.

Although banding results in minor discomfort at the time of castration, numerous studies have found that cattle show signs of pain for up to several weeks following the application of the band or ring. Surgical and Burdizzo castration may be better options from an animal care perspective. The advantage of these two methods is that pain can be minimized by providing immediate pain mitigation at the time of surgery as well as post-operative analgesia.

✓ **Branding**

- Cattle are branded at the earliest age possible.
- Pain mitigation for branding is provided in accordance with the signed protocol by the Veterinarian of Record.
- The written Herd Health Plan includes an effective written protocol for branding.

In some cases, branding is required by state law or is used to prevent theft and assure ownership. A facility's written Herd Health Plan should include a written protocol for branding if it is conducted on the facility.

Cattle should be branded at the earliest age possible and pain mitigation provided in accordance with the signed protocol by the VOR.

Little is known about how to alleviate the pain associated with hot iron and freeze branding, although freeze branding has been shown to be less painful.

Recent research has shown that wounds incurred from branding are immediately painful regardless of anesthetics or non-steroidal anti-inflammatory drugs (NSAIDS) used at the time of procedure, and remain painful for at least 8 weeks afterwards. Under best practice, farms work with their veterinarian to evaluate the necessity of branding, opting to use other forms of ID such as tamper-proof RFID if possible. Brands must never be applied to the face.

Animal Management Observations

- ✓ **Each animal is permanently identified.**
- ✓ **The facility complies with the ban on routine tail docking.**

Identification

Animal identification and record keeping are critical for making important management decisions about feeding, grouping, selecting, treating, breeding and culling an animal from the herd. In addition, food safety, foreign animal disease threats and bio/agro-terrorism concerns make premise and individual animal identification a necessity.

In 2012, the U.S. Department of Agriculture (USDA) finalized the Animal Disease Traceability (ADT) rules establishing general regulations for improving the traceability of U.S. livestock moving between states. Under the ADT final rule, all dairy cattle females, regardless of age, and all male dairy cattle, including dairy steers born after March 11, 2013, are required to be officially identified by a device or method approved by USDA prior to interstate movement. The FARM Program recommends using 840-RFID ear tags, which USDA recognizes as an official identification device for the lifetime of an animal. Other acceptable permanent individual animal identification type include:

- Brite tags
- Vaccination tags
- Dangle tags
- Button tags
- Tattoo
- Ranch brand with cow number

Tail Docking

The National Dairy FARM Program opposes the routine tail docking of dairy animals, except in the extraordinary case of traumatic injury to an animal. This practice was phased out under FARM Program standards as of January 1, 2017.

Current scientific literature indicates that routine tail docking provides no benefit to the animal or quality of the milk. The American Veterinary Medical Association (AVMA), the American Association of Bovine Practitioners (AABP) and the National Mastitis Council all oppose the routine tail docking of cattle. Switch trimming is the recommended alternative.

MAKING THE SWITCH

Switch trimming is the best management practice a farmer can use to transition away from tail docking. On an individual farm basis, as with all farm practices, you should evaluate the timing and method of the procedure to ensure it meets your farm's individual needs.

There are many switch trimming tools, including hand shears, scissors and clippers. Regardless of method, family and non-family employees should be appropriately trained on how to switch trim.

Successfully transitioning away from tail docking also includes being considerate and aware of cows' full tails. Areas where additional training should be focused may include:

- Stall, alley, walkways and parlor cleanliness
- Attaching milking units: tails may need to be gently moved to the side to access the udder
- Animal movement around barriers (i.e. gates with latches)

Family and non-family employees should also wear eye protection to protect eyes from any foreign objects, liquids, etc.

Facility management is important to the transition as well. High quality milk is achievable by following consistent milking procedure protocols. Also, routine cleaning, raking and scraping manure from stalls, alleys, walkways and the parlor during and/or in between each milking time will help maintain cleanliness of animals and facilities.

Source: https://nationaldairyfarm.com/wp-content/uploads/2018/10/Making-the-Switch_0.pdf

Outcomes-Based Animal Observations

- ✓ **99% or more of pre-weaned calves (>2 days old), post-weaned heifers and lactating cows observed have a body condition score of 2 or greater on FARM Body Condition Scorecard.**
- ✓ **95% or more of lactating cows observed do not have broken tails.**
- ✓ **90% percent or more of pre-weaned calves (>2 days old), post-weaned heifers, pre-fresh heifers/dry cows and lactating cows observed score 2 or less on the FARM Hygiene Scorecard.**
- ✓ **95% or more of the lactating cows observed score 2 or less on the FARM Knee Scorecard.**
- ✓ **95% or more of the lactating cows observed score 2 or less on the FARM Hock Scorecard.**

- ✓ **95% or more of the lactating cows observed score 2 or less on the FARM Locomotion Scorecard.**

Observing outcomes-based animal measures is the best way to evaluate the care of animals on the farm. Hygiene, locomotion, body condition, hock and knee lesions and broken tails are the areas that are used to demonstrate this care. The guidelines that follow are based on review of extensive data in all areas of observation and the opinion of experts in dairy cattle care. Thresholds are set based on consensus among a group of experts and available data. These thresholds and scoring systems are revisited every three years.

- ✓ **99% or more of pre-weaned calves (>2 days old), post-weaned heifers and lactating cows observed have a body condition score of 2 or greater on FARM Body Condition Scorecard.**

Achieving growth targets for heifers and monitoring change in body condition during gestation and lactation are very important. Body condition can change rapidly at and after calving and can be used to guide ration changes. Body condition scoring for dairy cattle is an important management tool for optimizing milk production and reproductive efficiency, while reducing the incidence of metabolic and other peripartum diseases. Over-conditioning at the time of calving (BCS > 4) often results in lower feed intake and increased incidence of peripartum problems. BCS loss of more than 1 during early lactation is excessive and requires attention by the producer and nutrition professionals.

- ✓ **95% or more of lactating cows observed do not have broken tails.**

The tail must never be used aggressively to move a cow.

Calm and appropriate handling does not result in harm to the animals. Tails can be broken through twisting, jacking or other rough handling. This animal observation is set to detect farm-wide problems in animal handling. The widespread presence of broken tails indicates that there is or has been handling and stockmanship breakdown. It is useful to investigate patterns in tail breaks, considering the age class affected, the location of the breaks within the tail, and observing handling to determine when and how tails may be broken.

- ✓ **90% percent or more of pre-weaned calves (>2 days old), post-weaned heifers, pre-fresh heifers/dry cows and lactating cows observed score 2 or less on the FARM Hygiene Scorecard.**

Proper sanitation and cleanliness management keep animals dry, clean and free of manure and provide them with a comfortable environment. The goals of sanitation for animal facilities are to:

- Maintain a clean and dry resting area for the animal
- Minimize animal disease
- Minimize generation of odors and dust
- Minimize pests and parasites
- Minimize spread of pathogens

Basic sanitation practices include keeping the interiors, corridors and storage spaces of animal facilities clean. Facilities should be free of standing water, excess manure, unnecessary farm items

and clutter. Feed and bedding should be clean and dry, even in areas with minimal housing and rainfall. Animal caretakers should also maintain a level of cleanliness to minimize the spread of pathogens.

Open-lot facilities may need to be scraped and refilled with uncontaminated materials. Removal of cattle for a short time may be a means of eliminating muddy areas in pastures. Manure should be removed regularly from facilities, and walkways should be cleaned and have good traction. In addition to affecting udder and leg cleanliness, manure in the alleyway contributes to lameness problems described below. In best practice, all lying areas are clean, dry and groomed.

Cleanliness of belly and flank are often an outcome of the dryness of the resting area. Cattle prefer dry lying areas, spend more time resting on dry surfaces.

- ✓ **95% or more of the lactating cows observed score 2 or less on the FARM Knee Scorecard.**
- ✓ **95% or more of the lactating cows observed score 2 or less on the FARM Hock Scorecard.**

Skin injuries on cattle tend to occur on areas that are in contact with elements of housing, with the most common injuries observed on the knees and hocks. These injuries range from a small area of hair loss to open wounds, and are sometimes accompanied by infection and swelling of the joint. A healthy hock is free from hair loss and swelling. Skin breakage provides an opportunity for infection to occur, which can lead to swelling, pain and lameness.

A series of studies, including work on U.S. farms, shows that the risk of hock injuries can be greatly reduced by using deep bedding and that lesions are more common on farms using poorly bedded surfaces like mats and mattresses.

- ✓ **95% or more of the lactating cows observed score 2 or less on the FARM Locomotion Scorecard.**

Lameness, caused by painful lesions to the limb or foot, seriously compromises animal welfare and continues to be a major area of concern. Because of this, lameness should be a management priority for all dairy herds. Foot lesions most commonly associated with lameness in dairy cattle include infectious hoof diseases such as digital dermatitis (hairy heel wart) and foot rot, as well as non-infectious claw horn diseases that include white line lesions and sole ulcers. Lameness interferes with normal resting behavior, movement to and from the milking area and feeding activity. It limits the exhibition of estrus and influences general health.

Lameness may be reduced by improving cow comfort, through preventive hoof trimming and by surveillance for lame cows coupled with prompt, effective treatment. Routine use of foot baths assists in the control of infectious hoof disease, while improved flooring reduces trauma, slipping and wear, which lowers the risk for white line lesions.

Sole ulceration may be reduced by providing adequate time for daily rest. This involves strategies such as providing a comfortable resting space, minimizing time out of the pen milking to less than 3 hours per day, avoiding overstocking and providing an appropriate thermal environment

Chapter 6: Antibiotic Stewardship

Management Checklist

- ✓ **The facility adheres to all withdrawal times for milk. All official samples of sold milk have tested negative for antibiotics in the last 3 years.**
 - ✓ **The facility adheres to all withdrawal times for meat. All meat tissues from animals sent for meat production have tested negative for violative residues in the last 3 years.**
-

The U.S. dairy industry is committed to producing the highest quality, safe, abundant and affordable milk and dairy beef. Healthy animals help make for safe food, and disease prevention is the key to keeping cows healthy.

When dairy animals get sick and treatment is necessary, producers and veterinarians use antibiotics and other drugs prudently. Antimicrobials must be used appropriately under veterinary guidance to prevent residues from occurring in milk and dairy beef. The marketing of milk or dairy beef with drug residues, even unintentionally, is illegal and can result in financial and criminal penalties.

Dairy producers realize the importance of eliminating the possibilities of having drug residues in milk and dairy beef. Producers can take the following steps to mitigate or lessen the chances of antibiotic residues:

- Establish a valid Veterinarian-Client-Patient Relationship (VCPR) to ensure proper diagnosis and treatment of disease. The agreement should be reviewed annually with the Veterinarian of Record (VOR) who makes routine visit to the farm.
- Keep records of antibiotic use and identify all treated animals, including treatment protocols.
- Implement a preventive Herd Health Plan to reduce the incidence of disease.
- Maintain milk quality and implement an effective mastitis management program to reduce the use of antibiotics, including protocol development and review.
- Implement family and non-family employee training and awareness of proper animal drug use.
- Use drugs approved for specific disease indications according to labeled recommendations and withdrawal periods. If extra label drug use is indicated by a veterinarian's prescription, that veterinarian must establish and document appropriate withdrawal periods.
- Do not use drugs that are specifically prohibited for use in milking, dry or growing animals.
- Segregate and milk treated animals after, or in a separate facility from, all non-treated animals to ensure that milk is not accidentally commingled.
- Use drug residue screening tests specific for the drug used before marketing milk and/or meat from treated animals.
- If in doubt about residue status, do not market milk and/or cull treated animals.
- Ensure that your antibiotics are stored securely and monitor your farm for any suspicious activity.

FOOD ANIMAL RESIDUE AVOIDANCE DATABANK (FARAD)

FARAD is a university-based national program that serves as the primary source for scientifically-based recommendations regarding safe withdrawal intervals of drugs and chemicals in food-producing animals. As such, FARAD is a key resource for protection of our nation's food supply, including meat, milk and eggs, against accidental contamination of animal-derived foods with violative residues of drugs, pesticides or other agents that could compromise food safety.

Modern animal agriculture relies heavily on the use of therapeutic drugs, pesticides and other agents that improve overall animal health and promote safe, efficient and humane production practices. Through the assimilation of a comprehensive drug database and the use of state-of-the-art pharmacokinetic modeling, FARAD scientists determine appropriate withdrawal periods for a wide array of chemical entities and provide this information to veterinarians, extension specialists and livestock producers through a toll-free call center as well as a publicly-accessible website ([FARMWeb](#)).

In addition, FARAD provides rapid response assistance regarding extra-label use of drugs in animal agriculture, and during food contamination emergencies which might arise from accidental exposure to environmental toxins, particularly pesticides, or intentional efforts to contaminate the food supply. Finally, FARAD provides assistance in trade matters related to foreign drug approvals and trains future veterinarians in the principles of residue avoidance.

FARAD is a USDA-funded university-based consortium that is overseen and operated by faculty and staff within the Colleges of Veterinary Medicine at the [University of California-Davis](#), the [University of Florida](#), [Kansas State University](#), [North Carolina State University](#) and [Virginia-Maryland College of Veterinary Medicine](#).

FARM Drug Residue and Prevention Manual

[The FARM Drug Residue and Prevention Manual](#) and accompanying pocket guide are educational tools for dairy farm managers throughout the country on the prudent and responsible use of antibiotics, including avoidance of drug residues in milk and meat.

These are quick resources to review those antibiotics approved for dairy animals and can also be used as an educational tool and resource for farm managers as they develop on-farm best management practices necessary to avoid milk and meat residues.

Food Armor Program

Food Armor, an organization dedicated to improving antimicrobial stewardship practices in food animal agriculture, teaches residue prevention, food safety principles, responsible drug use practices and antimicrobial stewardship. A team based of food industry professionals, ranging from producers and veterinarians to packers, processors and food marketers, this broad stakeholder consensus works to deliver a program that translates solid framework into proven on-farm results.

Food Armor offers an online educational platform providing high quality stewardship education to both veterinarians and farmers. Through this self-paced program, learners work to develop habits and utilize tools to implement antimicrobial stewardship plans.

- ✓ **The facility adheres to all withdrawal times for milk. All official samples of sold milk have tested negative for antibiotics in the last three years.**

Milk Drug Residue Testing

Pasteurized Milk Ordinance (PMO)

The Grade “A” Pasteurized Milk Ordinance (PMO) are the rules that state regulatory agencies use to implement their Grade “A” milk programs, requiring that all bulk milk tankers be sampled and analyzed for beta-lactam drug residues before the milk is processed. The PMO also requires states to test farm-level milk samples at least 4 times every 6 months for antibiotics (called Section 6 testing). Most states use an inhibitor test, which shows sensitivity to any antibiotic in milk. Additionally, customers (e.g., processors) may require additional testing for quality assurance purposes. **Any tanker found positive for any antibiotic residue is rejected for human consumption.**

In 1996, of the 3,384,779 bulk milk pick-up tankers tested, 0.104 percent tested positive (<https://www.nmdrd.com/fy-96.pdf>). Through increased education and industry advancements, of the 3,572,766 bulk milk pick-up tankers tested by industry and state regulatory agencies from October 2018 to September 2019, 0.009 percent tested positive for drug residues. This signifies a dramatic decrease from an already low level of occurrence (<https://www.nmdrd.com/fy-18.pdf>).

- ✓ **The facility adheres to all withdrawal times for meat. All meat tissues from animals sent for meat production have tested negative for violative residues in the last 3 years.**

Meat Drug Residue Testing

The United States Department of Agriculture Food Safety Inspection Service (USDA FSIS) conducts tests for chemicals – including antibiotics and other drugs, pesticides and environmental chemicals – in meat, poultry and egg products for human consumption. USDA Food Safety and Inspection Service Annual Sampling Program Plan tests for these chemicals through a random sampling of tissue from healthy-appearing food animals. The development of the plan by USDA FSIS includes:

- Determining the compounds are of food safety concern
- Using algorithms to rank the selected compounds
- Pairing these compounds with appropriate production classes
- Establishing the number of samples to be collected

The USDA FSIS Hazard Analysis and Critical Control Point (HACCP) program implemented at slaughter facilities identifies the animals most likely to have drug residues. Animals that display lameness, injection site lesions or signs of illness are targeted for testing.

If there is any doubt about the potential for drug residues in an animal, it should be withheld from market. Each year, about 3 million adult dairy cows are slaughtered for beef. Of that amount, a very small percentage tests positive for a residue. USDA FSIS has reported a 24 percent decline in the

number of tissue residues in market dairy cows during the most recent 5 years for which data has been released.

USDA FSIS Residue Repeat Violator Lists

The USDA FSIS maintains a “Residue Repeat Violator List for Use by FSIS Inspection Personnel” that contains the names and addresses of producers who have more than 1 meat residue violation in a 12-month period in animals presented for slaughter. Specific information about the violation can also be found in this list, including the plant where the violation was determined, the drug residues identified and their concentrations and tolerances. Violators listed may have had multiple violations documented in the same processing facility or in separate facilities. This list is intended to aid inspectors in discovering residue tolerance violations before they reach consumers. The USDA FSIS provides a [user guide](#) that explains the information contained in the list.

The USDA FSIS also maintains a “Residue Repeat Violator List for Use by Livestock Markets and Establishments” that contains similar information intended to assist plant owners and operators in identifying residue history of livestock suppliers. This list documents only the source name and address information of repeat violators, so that livestock marketers and buyers may use precaution when marketing and processing animals from listed suppliers. The USDA FSIS provides a [user guide](#) that explains the information contained in the list.

Conditions that Warrant Additional Testing at USDA Slaughter Facilities

The following list contains descriptions, directly from USDA documents, of conditions that may warrant testing of carcasses for drug residues:

Mastitis Signs of mastitis can vary based on the severity and duration of infection and may exhibit varying degrees of clinical signs, from pus-like or discolored discharge from the teats and redness and swelling of the udder, to no visible change in the udder.

Metritis USDA inspectors will look for this postmortem indication. Be mindful of sending animals to slaughter that show signs of metritis such as high fever, major drops in milk production, or eye or nasal discharge.

Signs of Treatment Leakage around jugular veins, subcutaneously, intramuscularly or intraperitoneally, or clinical signs indicative of treatment by mouth, such as discoloration from particles found in any part of the digestive tract, are important signs when examining veal calves for testing. Additionally, inspectors are aware of common industry practices that could indicate an animal was recently treated. Dairy cows arriving for slaughter with fetlock or ankle bands indicate that the animal has previously received treatment for a medical condition. When observed, inspectors are instructed to determine the appropriateness of additional testing or removal from the food supply.

Peritonitis and Surgery Signs of recent surgical procedures or findings of surgical devices (e.g., suture, toggles, fistula devices) are only significant if they are associated with active peritoneal or subcutaneous inflammation.

Injection Sites Live animals and carcasses with lesions or abscesses associated with injections on any part of the animal are of potential concern.

Other Disease Symptoms Any signs of the following diseases or conditions can lead to an animal being tested for potential chemical residues or to determine fitness for harvest:

- Depression
- An elevated or subnormal body temperature
- Hyperemic skin
- Congested mucous membranes
- Dehydration
- Poor body condition in association with an injury or inflammatory condition, such as abscesses, arthritis, pneumonia, mastitis, metritis or diamond skin

Tolerance Limits

The regulatory tolerances for milk and meat antibiotic residues vary depending on the type of drug used and route of administration. The withdrawal times and tolerances are **only valid if a drug is used according to the label directions and in the class of animal listed on the label.**

If a drug is used in a class of animal **not** on the label, then there is **NO TOLERANCE** established for that drug and any trace amount, even if it is below the target testing/tolerance level established for the labeled class, is a violation.

Drugs not approved for use in lactating dairy cattle do not have FDA-established tolerances for residues in milk. Further, the tissue tolerances for drugs approved for beef cattle do not apply to lactating dairy cattle. Extra-label drug use if used, must be prescribed by a veterinarian. A complete list of the tolerances can be found in the [FDA Green Book](#), which lists all approved animal drugs. If you have questions or concerns about potential residues or withdrawal times, please contact your herd veterinarian.

Drugs Not Approved for Use in Food-Producing Animals

The following drugs are **not approved for use in any species of food-producing animal:**

- Chloramphenicol
- Clenbuterol
- Diethylstilbestrol (DES)
- Dipyrone
- Gentian violet
- Glycopeptides (example vancomycin)
- Nitrofurans (including topical use)
- Nitroimidazoles (including metronidazole)

Following a thorough literature review, the American Veterinary Medical Association (AVMA), the American Association of Bovine Practitioners (AABP) and the Academy of Veterinary Consultants (AVC) recommend that veterinarians refrain from using aminoglycosides (Amikacin, Gentamicin, Kanamycin and Neomycin) in cattle except where approved for use by the Food and Drug Administration, as these antibiotics can cause very prolonged tissue residues.

Extra-Label Drug Use

“Federal law restricts this drug to use by or on the order of a licensed veterinarian.”

This statement is on every prescription drug sold. Any use of a drug not specifically listed on the label is called “extra-label drug use” and is regulated by the FDA under the Animal Medicinal Drug Use Clarification Act (AMDUCA) of 1994. Using a prescription or over-the-counter drug in an extra-label manner is illegal unless it is specifically prescribed with withdrawal times by a veterinarian working in the context of a Veterinarian-Client-Patient Relationship (VCPR).

Any extra-label use of antibiotics must be used as a prescription and must include the written instructions for the specific lifecycle of animals to be treated, including dose, route of administration, frequency of use and withdrawal times for milk and/or meat. Extra-label use will generally require an extended withdrawal time.

Examples of extra-label drug use:

- Changing the dose, such as giving more penicillin than is listed on the label
- Changing the route of administration, such as giving flunixin intramuscularly (IM) or subcutaneously (SQ) instead of intravenously (IV)
- Giving a drug to a different production class of animal, such as using Nuflor® in a lactating dairy cow
- Giving a drug for an indication (disease) not listed on the label, such as using Excede® for diarrhea
- Changing the withholding times, such as not following milk withholding times for fresh cows after dry treatment administration
- Changing the amount of drug per injection site
- Changing the duration of therapy

FARM Program Drug Residue Manual

The FARM Antibiotic Stewardship module provides ongoing education for the dairy community on the responsible use of antibiotics to keep cows healthy and our milk supply safe.

FARM’s [Milk and Dairy Beef Drug Residue Prevention Reference Manual](#) is the primary educational tool for dairy farms throughout the country on the judicious and responsible use of antibiotics, including avoidance of drug residues in milk and meat.

Updated each year, the manual and accompanying pocket guide are convenient resources detailing which antibiotics and other drugs are approved for treatment of dairy animals.

Chapter 7: Pre-Weaned Calves

Management Checklist

- ✓ Facilities are designed to have a calving area that is clean, soft, dry, well-lit and well-ventilated.
- ✓ All pre-weaned calves are moved by lifting, walking or the use of clean, properly designed mechanical transport devices.
- ✓ All pre-weaned calves (heifers and bulls) receive colostrum or colostrum replacer within 6 hours after birth, even if immediately transported off the farm.
- ✓ All pre-weaned calves (heifers and bulls) receive a volume of milk or milk replacer to maintain health, growth and vigor until weaned or marketed.
- ✓ All pre-weaned calves (heifers and bulls) are offered fresh, palatable starter feed by day 3 to maintain health, growth and vigor.
- ✓ All pre-weaned calves (heifers and bulls) have access by day 3 to clean, fresh water appropriate for climatic conditions.
- ✓ All calves are disbudded before 8 weeks of age.
- ✓ Pain mitigation for disbudding is provided.
- ✓ The written Herd Health Plan has a written protocol for pre-weaned calf care that includes language specific to areas of pre-weaned calf management.

-
- ✓ **Facilities are designed to have a calving area that is clean, soft, dry, well-lit and well-ventilated.**

A clean, soft, dry, well-lit and well-ventilated calving area has many health benefits for the calf at the time of birth. A separate calving area that is designed to be comfortable, functional and hygienic allows for close observation of the cow and easier, more effective assistance at calving. Recent work indicates that cows prefer social isolation beginning about 8 hours prior to calving. Wet, dirty calving areas foster the growth of bacteria that can invade the newborn calf's navel or mouth and create a disease load that overwhelms the calf's naïve immune system. A best practice is to clean pens or paddocks between calvings.

- ✓ **All pre-weaned calves are moved by lifting, walking or the use of clean, properly designed mechanical transport devices.**

Calves should be handled in a calm, controlled and gentle manner. Animal caretakers should be provided appropriate continuing education or training in animal handling, and the unique ways in which calves should be handled. Calves should be moved by a clean, properly designed transport device such as a calf cart, clean wheelbarrow or similar device with appropriate restraint that ensures calf safety and care. Manual movement of calves is also acceptable and can include walking calves or lifting them from their underside with all four legs gathered. Recognize that calf flight zones are different than that of adult dairy cattle and that they should be handled with that

consideration in mind. Calves should never be dragged, pulled or caught by the neck, ears, limbs, tail or any other extremities, or thrown.

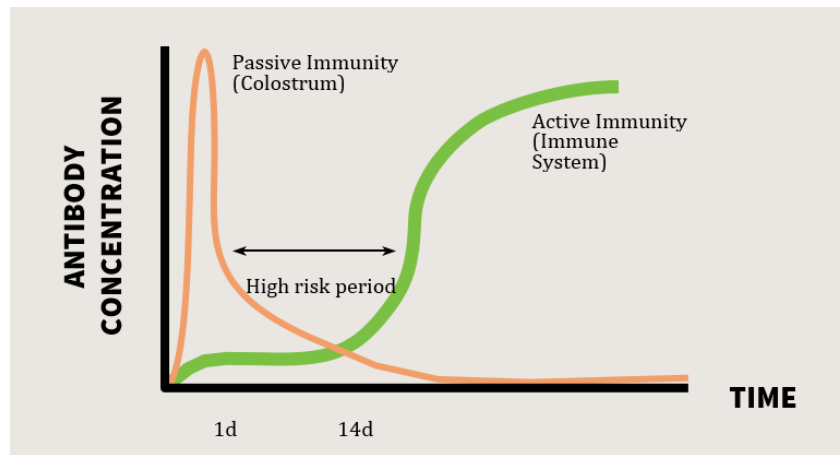
- ✓ **All pre-weaned calves (heifers and bulls) receive colostrum or colostrum replacer within 6 hours after birth, even if immediately transported off the farm.**

Colostrum feeding has an important influence on the long-term health and well-being of calves. Calf care and feeding should be based on the counsel of a qualified nutritionist as well as the herd veterinarian.

Calves should receive 4-to-5 quarts of high-quality colostrum or colostrum replacer (3-to-4 quarts for smaller dairy breeds) or 10 percent of body weight or colostrum replacer in one or two feedings within the first 6 hours of life.

Monitoring colostrum quality before feeding (e.g. using a Brix refractometer or colostrometer) is considered best practice. Effective colostrum replacements should provide at least 100 grams, 150-to-200 grams is preferred, of immunoglobulin G (IgG). Colostrum quality is highly dependent on early harvest. The IgG content of the colostrum is of high quality if it is over 50g/L. This equates to a Brix value greater or equal to 22 percent.

In addition, ensuring that IgG concentrations in the blood from taking calf-side samples is also an effective way of evaluating colostrum management practices. When determining the quality of colostrum, the blood-serum concentration of IgG goal should be greater than 10.0 mg per ml or serum total protein greater than 5.5 grams per deciliter (g/dL) to support positive growth rates and reduced prevalence of sickness and death.



Source: Penn State [“Feeding the Newborn Calf”](#)

Inadequate colostrum intake results in failure of passive transfer (FPT), which influences the health and welfare of calves as well as the performance of calves when they reach lactation. To ensure good colostrum management practices dairy farmers are encouraged to work with their veterinarian to assess failure of passive transfer.

Esophageal Tube Feeder

Newborn calves are sometimes too weak to suckle or nurse from a bottle. The esophageal tube feeder is an excellent device for feeding colostrum to calves. Proper training on the use, cleaning and sanitation of the feeder is essential for calf health.

The esophageal feeder consists of an esophageal probe, tube, clamp, and fluid container. The probe is a rigid or semiflexible tube made of plastic or stainless steel. It has a tear-shaped end designed to be easily inserted into the esophagus but not into the trachea (windpipe). The esophageal feeder should be thoroughly cleaned to prevent bacterial growth, especially after it has been used for colostrum.

The first step in using an esophageal feeder is to determine the length of tube to be inserted. Measure from the tip of the calf's nose to the point of its elbow, which is the approximate location of the diaphragm. This distance is about 20 inches in most Holstein calves (Figure 10). The proper length can be marked on the tube with a piece of tape. In young calves, only about 20 inches of the tube should be passed into the mouth and down the esophagus (Figure 11).

The tube should first be lubricated by dipping it in the colostrum or milk. A calf will likely suck the end of the tube into its mouth, which makes the tube easier to pass.

Open the calf's mouth by applying pressure to the corner of the mouth or by grabbing over the bridge of the nose and applying pressure to the upper palate or gums. Once the mouth is open, pass the tube slowly along the tongue to the back of the mouth. When the tube is over the back of the tongue, the calf starts chewing and swallowing. The tube should then be passed down the esophagus. A correctly passed tube can be felt in the esophagus; the ball on the end of the tube can be felt easily.

If possible, the calf should be standing before feeding so fluids are less likely to back up and enter its lungs. Calves are properly restrained for this process.

After the tube is passed and before any liquids are given, the tube should be checked for proper positioning in the esophagus (Figure 12). If it is properly positioned, the rings of the trachea and the rigid enlarged esophagus can be felt easily. Check the exposed end of the tube for spurts of air, which indicate that the tube is in the trachea.

Next, unclip the tube to allow the liquid to drain out of the bag. Hold the bag above the calf or hang it on a nail; it will take several minutes to drain. Liquids should be at body temperature to prevent temperature shock to an already weak calf.

When feeding is over, slowly remove the tube. Clean and sanitize the feeder, and then allow it to drain and dry.

Figure 10. Hyperextension of a calf's neck and points for estimating length of esophageal tube.

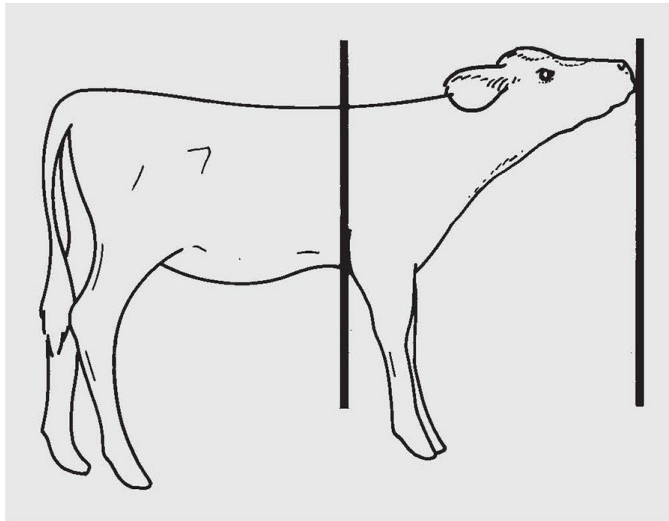


Figure 11: Internal view of mouth and esophagus

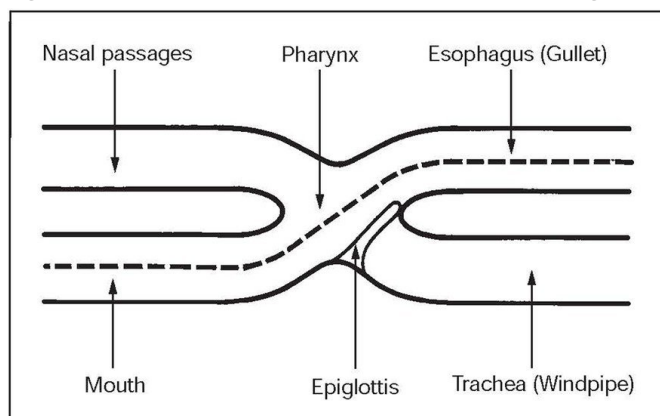
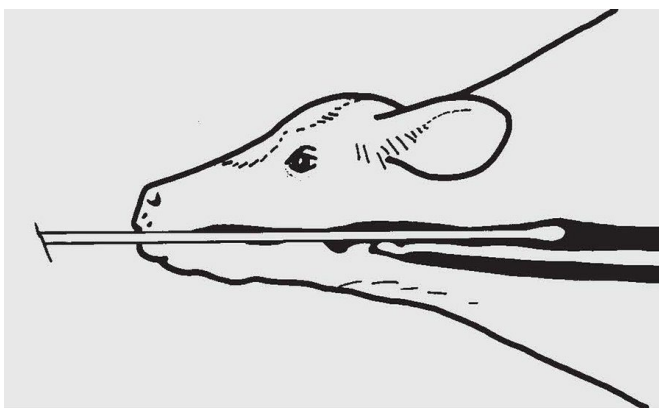


Figure 12. Position of esophageal feeder in relationship to the trachea



- ✓ **All pre-weaned calves (heifers and bulls) receive a volume of milk or milk replacer to maintain health, growth and vigor until weaned or marketed.**

After receiving immunity through feeding colostrum or colostrum replacer, calves should be fed milk or milk replacer through weaning.

The goal of calf nutrition is to promote healthy, efficient, rapid growth with milk or milk replacer and enhance rumen growth and function by initiating grain intake.

Calves benefit from higher milk/milk replacer intakes during the first 4 weeks of life when their ability to digest solid feed is limited. Benefits of improved growth and reduced hunger can be achieved by feeding calves more milk or milk replacer equivalent.

Calves are motivated to consume large amounts of milk or milk replacer equivalent. Holstein calves will drink in excess of 8 quarts or more in 2 or more feedings per day. The long-term benefits of providing an increased volume of milk/milk replacer include earlier breeding ages and higher milk yield later in life. There are no known negative side effects of feeding more milk/milk replacer.

Higher milk intakes will result in looser feces, but this is not associated with increased diarrhea or other health problems. Newborn calves are susceptible to neonatal calf diarrhea (calf scours), especially during their first 28 days of life. However, this must not be confused with looser feces associated with feeding calves higher volumes of milk. Acquired immunity from colostrum is the first and most important control measure for diarrhea.

Feeding only 4 quarts per day of milk or milk replacer equivalent does not allow the calf to meet its nutritional requirements for maintenance, growth and development and is associated with hunger behavior.⁹

Good milk replacer should mix easily in warm water and stay in solution after mixing. Animal caretakers should take care to use the appropriate weight of milk replacer powder volume, temperature, freshness and cleanliness of water to ensure consistency when mixing milk replacers, and use clean feeders.

Caution should be taken if calves destined for sale or slaughter are fed a medicated milk replacer or milk from cows treated with antibiotics. This will prevent problems associated with antibiotic residues in the meat of slaughtered calves. All withdrawal times for medicated feeds must be followed.

- ✓ **All pre-weaned calves (heifers and bulls) are offered fresh, palatable starter feed by day 3 to maintain health, growth and vigor.**

Introducing small amounts of fresh, palatable, high-quality starter feed by day 3 allows for a calf to meet its nutritional needs and enhance rumen development.

As the calf's body size is expanding in response to milk feeding, it needs more nutrients to maintain itself, which is where starter feed becomes an essential part of the diet. Starter feed fills the nutritional gap between the growing animal and fixed nutrients coming from milk. It is important that calves consume starter early to prepare the rumen in physical size and metabolic activity to be able to sustain the calf on dry feed post-weaning. Starter feed should be replaced daily.

- ✓ **All pre-weaned calves (heifers and bulls) have access by day 3 to clean, fresh water appropriate for climatic conditions.**

Calves should have access to clean, fresh water to maintain proper hydration by day 3 of life under the assumption that proper quantity and quality of colostrum/colostrum replacer and milk/milk replacer has been provided. Feeding free-choice water to pre-weaned calves has been proven to improve rate of gain from birth to weaning by 33 percent to calves receiving no water. Additionally, daily water changes have been shown to have a 5 percent weight-gain advantage compared to those calves whose water was changed once a week.

Feeding milk or replacer should not be a substitute for water. When milk is consumed, it goes directly to the abomasum, bypassing the rumen via the esophageal groove, while water goes into the rumen. Without water in the rumen, rumen development slows dramatically. Free water intake is essential for proper rumen function and for early intake of dry feed.

In cold weather, it is advised to feed water that is close to a calf's body temperature of 102° F and provide water close to their predicted consumption.

- ✓ **All calves are disbudded before 8 weeks of age.**

Horned cattle are a major management concern on farms, causing significant risks for other animals and animal caretakers. Removing the horns, or disbudding, has benefits for both cattle and human safety.

The term disbudding refers to the destruction or excision of horn-producing cells before skull attachment, while dehorning involves the excision of the horn after skull attachment. Time of attachment varies, but scientific literature indicates that this occurs around 8 weeks of age. Therefore, best practice is to conduct disbudding at the earliest age possible, before 8 weeks of age.

There is scientific evidence that both disbudding and dehorning are painful procedures. Administration of local anesthesia, non-steroidal anti-inflammatory drugs (NSAID) and sedatives all have been shown to provide benefits to calf welfare. An effective pain management protocol is required and should be implemented with guidance from your veterinarian.

Acceptable methods for disbudding include application of caustic paste or an electric/gas iron to destroy the horn producing cells. Caustic paste should be applied within the first few days of life and is less effective and discouraged after the calf is 2 weeks of age.

Additional management for caustic paste disbudding, such as protecting treated calves from rain and limiting social interactions to ensure paste only affects the horn bud area, are considered best practice. Effective pain management is still required with this method of horn removal.

Cows that have either been missed or have developed scurs should be monitored and, if deemed necessary, dehorned. Any attempt to permanently remove the horn after 8 weeks of age is considered a surgical procedure and should be performed by a licensed veterinarian.

The use of polled genetics may be an option for some producers depending on the breed of cattle on the dairy or the genetic diversity of polled genetics. Currently there are challenges in the diversity and availability of polled genetics available in the U.S. dairy herd.

✓ **Pain mitigation for disbudding is provided.**

All methods of disbudding and dehorning cause pain. AABP recommends that pain management be considered the standard of care during all dehorning and disbudding procedures. Producers are encouraged to work with their Veterinarian of Record (VOR), who is best able to develop the most appropriate, individualized pain management protocol for their operation. Scientific evidence supports that it is possible to enhance animal welfare associated with these necessary procedures with the implementation of pain management protocols.

Local Anesthesia

Use of a local anesthetic mitigates the immediate pain associated with disbudding and dehorning and provides up to 5 hours of post-procedural analgesia. There are a variety of local anesthetic techniques including:

- Cornual nerve block
- Horn bud infiltration

The local anesthetic protocol should be determined and prescribed by the VOR. Federal law restricts the use of local anesthetics to use by or on the order of a licensed veterinarian.

Systemic Pain Relief

Non-steroidal anti-inflammatory drugs (NSAIDs) should be used to provide additional and longer lasting pain relief. The use of injectable, topical or oral NSAIDs are acceptable for pain mitigation in the immediate post-operative period. The type of NSAID used should be prescribed by the VOR.

- Meloxicam has been shown to mitigate post-procedure pain for up to 48 hours after a single dose of the drug.
- Topical NSAID applications make the administration of NSAID therapy at the time of disbudding or dehorning practical in most instances.
- Oral, IV or IM administration is difficult although further study is warranted to determine its effectiveness in mitigating dehorning pain.

There are currently no approved drugs in the U.S. for use in cattle with an indication to provide analgesia associated with dehorning pain. Regulations under the Animal Medicinal Drug Use Clarification Act of 1994 (AMDUCA) allow extra-label drug use provided a valid Veterinarian-Client-Patient Relationship (VCPR) exists and the drug selection process, records and withholding times outlined in the AMDUCA regulations are followed.

When it comes to pain mitigation, the prescribing veterinarian must assign an adequate meat and milk withdrawal interval (WDI) in instances of extra-label drug use (ELDU) as prescribed by AMDUCA. The best resource for veterinarians to find an appropriate WDI is the Food Animal Residue Avoidance Databank, or FARAD.

Veterinarians should submit the required information (dose, route, frequency, duration, weight of animal) and FARAD will provide a WDI. Veterinarians should then save this in their records as evidence of due diligence in assigning a WDI.

Withdrawal Intervals

- ✓ **The written Herd Health Plan has a written protocol for pre-weaned calf care that includes language specific to areas of pre-weaned calf management.**

The written Herd Health Plan must have a written protocol for pre-weaned calf care that includes language specific to the following areas of pre-weaned calf management, including:

- All pre-weaned calves are moved by lifting, walking or the use of clean, properly designed mechanical transport devices.
- All pre-weaned calves (heifers and bulls) receive colostrum or colostrum replacer within 6 hours after birth, even if immediately transported off the farm.
- All pre-weaned calves (heifers and bulls) receive a volume of milk or milk replacer to maintain health, growth and vigor until weaned or marketed.
- All pre-weaned calves (heifers and bulls) are offered fresh, palatable starter feed by day 3 to maintain health, growth and vigor.
- All pre-weaned calves (heifers and bulls) have access by day 3 to clean, fresh water appropriate for climatic conditions.
- All calves are disbudded before 8 weeks of age.
- Pain mitigation for disbudding is provided.

Chapter 8: Non-Ambulatory Animals

Management Checklist

- ✓ The written Herd Health Plan has a written protocol for non-ambulatory animal management that includes language specific to areas of non-ambulatory animal management.
- ✓ Facilities are designed to have a location to segregate weak, sick or injured animals.
- ✓ The location for weak, sick or injured animals provides animals with: feed, water, protection from heat and cold for typical climatic conditions, isolation from other ambulatory animals and protection from predators.
- ✓ Non-ambulatory animals are moved using proper methods including the use of special equipment.
- ✓ Non-ambulatory animals are provided prompt medical care.
- ✓ Non-ambulatory animals are provided access to feed, water, protection from heat and cold for typical climatic conditions, isolation from other ambulatory animals and protection from predators.

Moving Non-Ambulatory Animals

- ✓ **Non-ambulatory animals are moved using proper methods including the use of special equipment.**

The prognosis of an animal should always be considered before the decision is made to move an animal. If the animal is highly unlikely to become ambulatory again, with little chance of recovery or good quality of life, the animal should be promptly euthanized in accordance with the Herd Health Plan (See Chapter 9: Euthanasia).

Prevention, preparation and prompt action are keys to the proper handling of non-ambulatory animals.

Animals that are at high risk for becoming non-ambulatory are:

- Post-fresh animals (calcium deficiency, calving injury, etc.)
- Weak animals due to prolonged sickness or age
- Severely lame animals
- Emaciated animals due to prolonged sickness or nutritional deficiencies

Facility risk factors that may lead to non-ambulatory animals:

PROPER CARE FOR NON-AMBULATORY COWS

PREVENT

1. Ensure cows are consuming a balanced ration to prevent metabolic disease and manage body condition.
2. Ensure cows are able to rise soon after calving.
3. Observe cows daily for any abnormal activities.
4. Ensure employees are trained in low-stress cow handling and that alleyways are properly maintained to prevent cows from slips and falls and for proper feet and leg support.

PLAN

1. Identify who is trained and should be called for a non-ambulatory cow situation.
2. Have a team trained to properly move a non-ambulatory cow.
3. Have a written non-ambulatory cow protocol.
4. Have an identified hospital area.
5. REMAIN CALM.

CARE

1. Provide deep bedding at least 6" deep – sand is best.
2. Provide safe shelter from the elements and away from cows.
3. Put feed and water in tubs that do not tip over and are within easy reach – check availability at least twice a day.
4. Lift the cow using proper protocol or roll her onto her other side twice a day.
5. Consult with your herd veterinarian about a proper treatment plan for the cow.
6. Never drag cows.

COMMON CAUSES 5 Ms

- MILK FEVER**
Symptoms: dull/weak; trembling/twitching; temperature below 101°F; cold, droopy ears.
- TOXIC MASTITIS**
Symptoms: dull/weak; temperature extremes (high or low); sunken eyes; abdominal milk; head, pain and swelling of one or more quarters.
- TOXIC METRITIS**
Symptoms: dull/weak; temperature extremes (high or low); sunken eyes; watery, colored or cloudy vaginal discharge and odor.
- MUSCULOSKELETAL DAMAGE**
Symptoms: abnormal angle and/or swelling to limbs; suspect fracture or dislocation; paralysis.
- MASSIVE INFECTION**
Symptoms: dull/ depressed; sunken eyes; temperature extremes (high or low); difficulty breathing.

ASSIST THE COW TO STAND IF
a physical exam and initial treatment have been completed and she:

- ✓ is bright and alert
- ✓ is not severely trembling or twitching
- ✓ Does not have evidence of severe disease
- ✓ Does not appear severely weak
- ✓ Appears to have normal and functioning limbs

National Dairy Farm
Penn State
For additional resources visit nationaldairyfarm.com
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The [Proper Care for Non-Ambulatory Cows](http://nationaldairyfarm.com) poster is available at NationalDairyFarm.com

- Slippery floors
- Improperly designed loading areas into parlors and trucks
- High density situations

Non-ambulatory animals that cannot be carried should be moved using an appropriate mechanism. Appropriate mechanisms for movement include:

- Sled
- Belting with reinforced sides
- Sling
- Skidsteer bucket
 - Large enough to hold the entire animal
- Palletted forklift
 - Construct a pallet platform to fit over the forks
 - Angle the pallet's leading edge to form a ramp for rolling the cow onto the pallet
 - Equip the pallet with straps to prevent the animal from falling off
 - **Never use exposed forks**

In all situations, animals must be restrained appropriately as to not risk or cause additional injury.

Appropriate Procedure for Non-Ambulatory Animal Movement:

- Best practice is to have at least 3 people available to transfer the animal onto the movement mechanism. One person should run the equipment being used, and the other 2 should move the animal onto the selected movement device. To ensure the safety of the animal, individuals should walk alongside the animal and the movement device.
- Gently roll a non-ambulatory animal onto the movement device.
 - If the animal goes down in a pen or alley, plywood or belting may be attached to a truck or tractor that can be driven slowly and carefully to a transfer point.
 - Carefully transfer the animal from the plywood or belting to an appropriate movement device as listed above. When utilizing any of these methods, proper restraint of the animal should be utilized.

Non-Ambulatory Animal Movement: Sled/Belting



ANIMAL RESTRAINT

When moving a non-ambulatory animal, a halter should be placed on animal's head correctly with a high quality lead rope. The lead rope should be tied to above the hock on the same side the animal's head is turned toward. Two additional ropes should be tied: 1.) Above the knee on the opposite side of the head and, 2.) Above the hock on the opposite side of the head.



MOVEMENT TO HOSPITAL PEN

Secure the transportation device to a tractor or similar vehicle with the ability to slowly pull the transportation device with the animal safely in place. Have at least 2 individuals walk alongside of the animal to ensure its safety.



MOVEMENT ONTO TRANSPORTING DEVICE

With all three team members working together, slowly roll the animal onto the transportation device



HOSPITAL PEN

Once the animal reaches the hospital pen, gently slide it off of the transportation device into a clean, well bedded area.

Non-Ambulatory Animal Movement: Skidsteer/Bucket Loader



Follow above animal restraint steps. Bring bucket to the animal. Ensure padding is at the bucket lip edge to eliminate risk of injury by bucket. Ensure the bucket size is large enough for the animal needing to be moved.



Using at least 2 individuals, slowly slide the animal fully into the bucket



Bucket operator should slowly lift the bucket while at least 2 individuals slowly slide the animal fully into the bucket.



Once the animal is secured in the bucket, At least 2 individuals should walk along side of the bucket loader while it is in motion constantly monitoring the cow.



Once in the hospital pen location, the bucket should be slowly lowered with at least 2 two individuals ensuring the animal remains secure.. Slowly back the bucket loader away from the animal placing it onto a clean, well bedded area.

Improper Movement



Animals should never be dragged using mechanical force.



Animal should never be moved horizontally with hip lifts or lifted vertically where their feet cannot touch the ground.

Except for emergency cases where an animal must be moved a few feet before an appropriate movement device can be used (e.g. if a cow becomes non-ambulatory in the milking parlor and the animal is likely to recover and have a good quality of life), cattle are **not** to be pulled, dragged or otherwise moved horizontally or vertically by mechanical force that is applied directly to the animal. Specifically, hips lifts/clamps should never be used to move animals, only to lift and lower them and the animal should never be raised with any device to where her feet cannot touch the ground.

If the animal must be dragged because no other moving alternative exists or because it can only be saved only by dragging (e.g. if a cow falls into a manure pit where the likelihood of drowning is imminent), pad non-injured limbs and use padded belts to which a rope, chain or cable can be attached. Drag the animal the shortest possible distance to a point where a better method of moving can be employed. If this procedure cannot be done humanely, then the animal is to be euthanized in place and then moved.

Using an adequate number of trained people along with the appropriate equipment and handling devices will ensure the safety of the non-ambulatory animal and animal caretakers as well as increase the likelihood of recovery.

Non-Ambulatory Animal Care

- ✓ **Non-ambulatory animals are provided prompt medical care.**
- ✓ **Non-ambulatory animals are provided access to feed, water, protection from heat and cold for typical climatic conditions, isolation from other ambulatory animals and protection from predators.**

When an animal becomes non-ambulatory it should receive prompt medical care.

Non-ambulatory animals should be separated from the ambulatory animals in the herd and protected from heat and cold along with predators as to prevent further damage to the animal and to allow for enhanced medical treatment.

A non-ambulatory animal should have access to clean water and feed. Water should be provided multiple times and brought directly to the non-ambulatory animal throughout the day and night in order to maintain hydration, especially when water in buckets may be knocked over. The diet of a non-ambulatory animal may need to be adjusted from its healthy counterparts based on its feed intake abilities and special considerations for its illness or injury. Consult with a veterinarian or nutritionist to determine proper feed ration if necessary. The recovery of a non-ambulatory animal is enhanced through appropriate nutrition.

Facility Considerations for Weak, Sick or Injured animals

- ✓ **Facilities are designed to have a location to segregate weak, sick or injured animals.**
- ✓ **The location for weak, sick or injured animals provides animals with: feed, water, protection from heat and cold for typical climatic conditions, isolation from other ambulatory animals and protection from predators.**

A hospital or sick pen that isolates the animal(s) from the herd is best practice. Because weak, sick or injured animals are more susceptible to discomfort than are healthy animals, it is important that the pen be equipped to maximize animal comfort. The location should provide feed and water, protection from heat, cold and predators, and isolation from any ambulatory animals.

Herd Health Plan

- ✓ **The written Herd Health Plan has a written protocol for non-ambulatory animal management that includes language specific to areas of non-ambulatory animal management.**

Even with the best care and adherence to a Herd Health Plan, animals can become ill, requiring medical treatment. If an animal becomes non-ambulatory, it is essential that animal caretakers are prepared to handle these animals and make prompt decisions to treat or euthanize the animal. Having a written protocol for non-ambulatory animal management allows for consistency of training or continuing education and proper execution of the steps for the most desirable outcome for the animal.

Chapter 9: Euthanasia

Management Checklist

- ✓ Criteria for identification of animals to be euthanized are established.
- ✓ Euthanasia techniques follow the approved methods of AABP and/or AVMA.
- ✓ Carcass disposal is conducted using the appropriate method in accordance with applicable local ordinances.
- ✓ The written Herd Health Plan has a written protocol for euthanasia that includes language specific to areas of euthanasia.

Euthanasia is an unfortunate but necessary part of life on a dairy farm. No one wants to lose an animal or see an animal suffer.

When an animal's quality of life has decreased or when pain and suffering cannot be alleviated, euthanasia is the ethical and humane thing to do.

- ✓ **Criteria for identification of animals to be euthanized are established.**

Animal caretakers must be provided with guidance and continuing education or training to recognize situations where euthanasia is the best option for an animal.

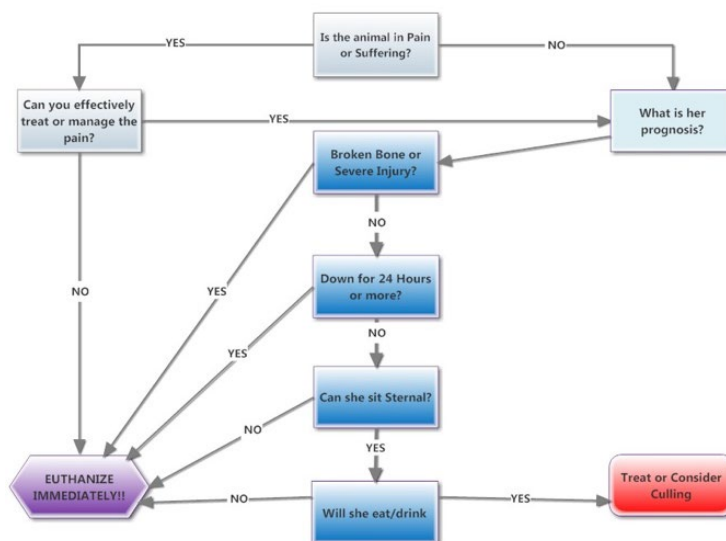
If an animal becomes non-ambulatory, meaning they are unable or unwilling to stand the animal caretaker must determine immediately whether the injured animal is otherwise healthy and can be nursed back to health or cannot be saved.

If there are indications that the non-ambulatory animal can recover, and quality of life can be re-established, dairy operations should follow their non-ambulatory animal protocol.

However, when an animal's quality of life is decreased or when pain and suffering cannot be alleviated, euthanasia is appropriate.

Euthanasia Decision Tree

This is an example of a decision tree. It would need to reflect of facility-specific decision-making euthanasia protocol.



Euthanasia Decision Making Considerations

The following criteria should be considered for the care compromised cattle:

- Pain and distress of animal
- Likelihood of recovery
- Ability to get to feed and water
- Drug withdrawal time
- Economic considerations
- Condemnation potential
- Diagnostic information

✓ **Euthanasia techniques follow the approved methods of AABP and/or AVMA.**

If an animal appears to be suffering from any of the indications requiring immediate euthanasia, the procedure should be performed by designated animal caretakers trained to perform euthanasia. The technique must follow the approved methods of the American Association of Bovine Practitioners (AABP) or the American Veterinary Medical Association (AVMA). Proper euthanasia techniques include initial method, how to confirm death and a secondary method (if needed).

Indications for Euthanasia

The following conditions or situations may lead to an animal being compromised to such an extent that euthanasia should be performed:

- Catastrophic fracture, trauma or disease of the limbs, hips or spine resulting in immobility or inability to stand
- Bleeding uncontrollably from a major blood vessel
- Inability to maintain sitting upright position with head held up (sternal recumbency)
- Inability to move and raise front legs once lifted under assistance
- Loss of quality of life. Examples may include but are not limited to:
 - Disease conditions that produce a level of pain and distress that cannot be managed adequately
 - Emaciation and/or debilitation from disease
 - Age or injury that result in an animal being too compromised to be transported or marketed
- Disease conditions for which no effective treatment is known (i.e. Johne's disease, lymphoma)
- Diseases that involve a significant threat to human health (i.e. rabies)
- Chronic repeated bloating of the abomasum or rumen
- Chronic pneumonia and difficulty breathing/gasping for air
- Advanced ocular neoplastic conditions ("cancer eye")
- Disease conditions for which treatment is cost prohibitive
- Extended drug withdrawal time for clearance of tissue residue
- Poor prognosis or prolonged expected recovery

Table 1: Recommended methods for practical euthanasia

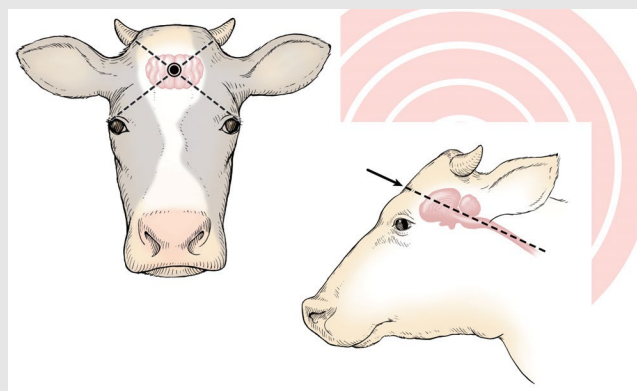
| Method | Risk to Human Safety | Skill Required | Potential Public Perception Issues | Adjunctive Method Required |
|--------------------------|----------------------|----------------|------------------------------------|----------------------------|
| Gunshot | high | moderate* | moderate: | no |
| Penetrating captive bolt | moderate | moderate* | some blood and motion | yes |
| Barbiturate overdose | low | moderate* | perceived well | no |

*Operator Training Required

Approved primary methods of euthanasia recommended by AABP include:

- Gunshot:** When properly executed, gunshot induces instantaneous unconsciousness and death, is inexpensive and does not require close contact with the animal. It should be emphasized that this method should only be attempted by individuals trained in the use of firearms and who understand the potential associated dangers. Firearm options include handguns (pistols), rifles or shotguns. Current recommendations suggest that the .22 caliber handgun or rifle loaded with a solid-point bullet is sufficient for calves, but may not be the best choice for consistent use on adult animals.

Gunshot Recommendations The “AVMA Guidelines for the Euthanasia of Animals (2013)” recommends the use of solid-point bullets. The 12-, 16-, and 20-gauge shotguns are a good choice for euthanasia of adult cattle. The 28 or .410 gauge shotgun is an excellent choice for use in calf euthanasia. If using a shotgun loaded with shot shells the operator should be very conscious of the distance from the gun barrel to the animal as projectiles will spread out into a larger pattern. Ideally, to obtain maximum consistency and efficacy of euthanasia, it is desired that the BBs from the shot shell make contact with the skull as a compact mass. When using a handgun, the firearm should be held within 1-to-2 feet of the intended target and the bullet should be directed perpendicular to the front of the skull to minimize the likelihood of ricochet. In cattle, the point of entry of the projectile should be at the intersection of 2 imaginary lines, each drawn from the outside corner of the eye to the base of the opposite horn.



- Penetrating Captive Bolt:** Captive bolt devices (“guns” or “stunners”) are either penetrating or non-penetrating. Only penetrating captive bolt devices are approved for euthanasia of mature bovines and, according to “AVMA Guidelines for Euthanasia of Animals (2013)”, must not be used as the sole method of euthanasia. The bolt gun must be placed firmly against the skull at the same entry point previously described for a gun shot. Since use of the captive bolt gun requires close proximity to the animal, adequate restraint and prior sedation or tranquilization may be required. It is critical to maintain and clean the bolt gun as described by the manufacturer. Additionally, selection of cartridge strength may vary among manufacturers and the appropriate type and strength for the size of the animal must be used. Store cartridges in a cool dry area, away from humid environments. Exposing cartridges to moisture can affect burning of the propellant and thus lower the bolt speed and penetrating force.
- Barbiturate Overdose:** When properly administered by the intravenous route, barbiturate overdose results in rapid loss of consciousness and death. When using sodium pentobarbital for this purpose, an appropriate dose is typically 60-80 mg/kg. When choosing a barbiturate for euthanasia, the barbiturate selected should be potent, long-acting and stable in solution. The carcass of barbiturate treated animals is considered unfit for human or animal consumption. Barbiturates can persist for long periods of time in the environment, which poses a risk to scavenging wildlife or companion animals. Ingestion of pentobarbital contaminated tissues by wildlife or rendered material consumed by domestic pets can induce toxicities. Finally, the use of pharmaceuticals limits carcass disposal options as renderers are less likely to accept animals euthanized by these methods.

Barbiturates are a controlled substance regulated by the DEA. Use of barbiturates are restricted by or on the order of a licensed veterinarian with a valid DEA license.

Determination of unconsciousness: A state of unconsciousness must be established immediately following the initial euthanasia procedure. It is critically important to confirm unconsciousness and then confirm death.

Secondary or adjunctive euthanasia methods must not be used until the animal has been determined to be unconscious. Signs may include:

- Absence of corneal reflex
- Absence of vocalization
- Absence of gag reflex
- Lack of rhythmic respiration
- No coordinated attempt to rise or right itself.

Confirmation of death

Confirmation of death is absolutely necessary regardless of what method of euthanasia is chosen. The primary indicator for death is cardiac arrest. Lack of a heartbeat and respiration for 3 to 5 minutes should be used to confirm death. Using a stethoscope placed behind the left elbow is the best method to confirm cardiac arrest. If the animal is unconscious but death cannot be confirmed, a secondary method of euthanasia must be immediately employed.

Examples of a secondary method include:

- Exsanguination (cutting the jugular veins and carotid artery in the neck or aorta rectally)
- Pithing (inserting a rod into the brain stem to cause destruction)
- Administration of a saturated salt such as potassium chloride, magnesium chloride or magnesium sulfate
- A second shot

It is inappropriate and inhumane to exsanguinate, pith or administer a saturated salt solution to an animal that is conscious. A second shot should be immediately administered to an animal that is not rendered unconscious from the first gunshot or captive bolt.

- ✓ **Carcass disposal is conducted using the appropriate method in accordance with applicable local ordinances.**

Dead animals, either euthanized or expired from natural causes, are potential sources of infection. Their carcasses must be promptly disposed of using appropriate methods, which may include rendering, burial, composting or incineration in accordance with applicable local ordinances. Consultation with local ordinances and the state veterinarian should be conducted to determine appropriate method for disposal.

Dead animals should be moved quickly to a designated location away from healthy animals and away from public view. Where warranted and feasible, waste and bedding of an animal that has died is removed from the facility to an area inaccessible to other animals.

A postmortem examination on well-preserved animals can provide important animal health information and prevent further losses to the herd.

- ✓ **The written Herd Health Plan as a written protocol for euthanasia that includes language specific to areas of euthanasia.**

A written Herd Health Plan that includes a protocol for euthanasia helps ensure that the decision to euthanize an animal can be made in order to reduce any unnecessary pain and suffering. Additionally, a protocol also allows for those animal caretakers to be trained to conduct euthanasia according to AABP/AVMA guidelines allowing for a humane death.

Chapter 10: Fitness to Transport

Management Checklist

- ✓ **The facility has an effective written protocol for fitness to transport that includes the definition of animals that are eligible to be marketed and outlines adherence to milk and meat withdrawal times.**

Dairy animals are an important source of beef in the United States. Approximately 20 percent of the nation's total beef production on an annual basis comes from the dairy sector, including fed dairy cattle and marketed cows and bulls. This chapter specifically focuses on considerations for the marketing of dairy animals for beef production. For information on animal care for beef animals (including dairy steers) please follow the guidelines of the [Beef Quality Assurance Program](#).

Dairy Beef

Marketing a dairy animal as beef is an important part of dairy farming. A dairy farmer must ensure the appropriateness of transitioning a dairy animal to the beef sector. In best practice, an animal should NOT be marketed if:

- The animal is non-ambulatory
- There is a reasonable chance it will become non-ambulatory at any time from leaving the farm to the slaughter facility
- Does not meet the food safety requirements for withdrawal periods or disease
- Animals are in poor body condition (less than BCS score 2)
- Animals have not met all treatment withdrawal times for milk and meat
- If calving is imminent and likely to occur during the transportation or marketing process
- If the animal has bone fractures of the limbs or injuries to the spine
- Animals have conditions that will not pass pre-slaughter inspection at a packing or processing facility.
 - If unsure, consult with your veterinarian before transporting an animal to a packing or processing facility.

USDA inspectors are instructed to look for animals that present a possible risk to the food supply and look for signs of disease or recent administration of animal health products to determine if an animal should be subjected to additional testing and possible removal from the food chain. In best practice, the dairy retains treatment records for at least 2 years.

Dairy producers should not transport animals with conditions that are unlikely to pass pre-slaughter inspection. These conditions include, but are not limited to:

- Cancer eye, blindness in both eyes
- Drug residues
- Fever greater than 103°F
- Peritonitis

- Cows that are calving or have a high likelihood of calving during transport
- Fractures or lameness (3 or greater on the FARM locomotion scale)
- Distended udders causing pain and ambulatory issues
- Unreduced prolapses
- Visible open wounds
- Suspected central nervous system symptoms

Conditions that Warrant Additional Testing at USDA Slaughter Facilities

The following list contains descriptions, directly from USDA documents, of conditions that may warrant testing of carcasses for drug residues.

- ***Mastitis***
- ***Metritis***
- ***Peritonitis and surgery***
- ***Injection sites***
- ***Other disease symptoms***
- ***Signs of treatment***

Additional considerations that should be followed to ensure a safe beef supply.

- The facility maintains permanent (written or electronic) treatment records, available for review by the VOR, for the treatment of the facility's common diseases that include: date of treatment, animal treated identification, name of the treatment used, disease/condition being treated, dosage administered, route of administration, duration of the treatment and specified withdrawal times for milk and meat to ensure food safety.
- The written herd health plan includes written protocols for the treatment of common diseases including:
 - Mastitis
 - Metritis
 - Milk Fever, ketosis, displaced abomasum (DA), pneumonia, diarrhea and any additional routinely occurring diseases identified by the veterinarian.
- The facility has a written protocol for fitness to transport that includes the definition of animals that are eligible to be marketed and outlines adherence to milk and meat withdrawal times.
- All family and non-family employees with determination of fitness to transport responsibilities have documented annual continuing education on the written protocol for fitness to transport conducted annually.
- Each animal is permanently identified.
- All meat tissues from animals processed for meat production have tested negative for violative residues in the last 3 years.

Transportation

Transporters play a critical role in the health and welfare of dairy cattle. The proper handling and transport of cattle can reduce sickness and injury, prevent bruises and improve the quality of the meat from these animals. In best practice, animal transporters are trained in how to properly move cattle up and onto the trailer, distribute cattle correctly on the trailer, employ hauling techniques that reduce cattle stress and handle emergency situations. For additional resources related to transportation best practices, please refer to the [BQA Transportation modules](#).

Additionally, dairy producers are encouraged to have transporters sign a Cow Care Agreement indicating that they have received basic stockmanship training and agree to treat all animals humanely. Using a transportation company that is knowledgeable about your animal care expectations provides safety and comfort of the animals during transport.

Loading and Unloading

Under best practice, animals are loaded and unloaded for transit in a manner that minimizes stress. The process of being moved, especially if it involves a loading chute, is a potentially stressful experience to many animals. In best practice, 3 measures should be taken to minimize stress: (1) train animal caretakers in proper loading and unloading practices, (2) properly locate and design loading areas and, (3) minimize the number of directional changes an animal must take. Prods, canes and other cattle handling aids are only used as a last resort, in emergency situations, and not in routine animal handling.

Animal caretakers should observe proper loading densities and plan to load or unload animals at the time of day that is best for moving the animals. In best

Top 11 Considerations for Culling (Refer to Poster)

1. Do not move non-ambulatory animals to market under any circumstances.
2. Make the decision to treat, to cull or to euthanize animals promptly. Sick and injured animals should be segregated from the herd.
3. Delay transport of an animal that appears to be exhausted or dehydrated until the animal is rested, fed and hydrated.
4. Milk all cows that are still lactating just prior to transporting to a packing plant or a processing facility.
5. Use a transportation company that is knowledgeable about your animal care expectations and provides for the safety and comfort of the animals during transport.
6. Do not transport animals to a packing or processing facility until all proper treatment withdrawal times have been followed.
7. Do not transport animals with a poor body condition, generally a Body Condition Score of less than 2 (1 - 5 scale)
8. Do not transport heifers or cows there calving is imminent and likely to occur during the transportation or marketing process.
9. Do not transport animals that require mechanical assistance to rise and walk, except to receive veterinary treatment. When using any handling device, abuse is never tolerated.
10. Do not transport animals with bone fractures of the limbs or injuries to the spine. Animals with a recent fracture unrelated to mobility should be culled and transported directly to a packing or processing facility.
11. Do not transport animals with conditions that will not pass pre-slaughter inspection at a packing or processing facility. If unsure, consult with your veterinarian before transporting an animal to a packing or processing facility.

practice, sufficient labor and appropriate equipment and/or facilities (i.e. ramps) are available for loading or unloading animals.

Trucks and Trailers

Trucks and trailers have an impact on animal care. Even though transport vehicles are not stationary, they are facilities that require the same consideration for cow comfort and needs. These include (1) clean/disinfected truck or trailer when moving young stock or cull cows, (2) sides high enough to prevent animals from jumping over them, (3) nonslip flooring that provides secure footing (avoid abrasive floor and wall surfaces), (4) ventilation and proper bedding to protect animals from weather extremes, and (5) adequate vehicle covering to protect animals from adverse weather.

In-Transit Care

Proper in-transit care will minimize animal injuries, bruises and carcass damage, which can impair the animals' well-being and value. In best practice, transport crews are knowledgeable about animal care expectations and skilled in handling animals properly. In general, chances for injuries decrease when animals on a truck are confined in several smaller groups. Weak or unhealthy animals are only shipped to a veterinarian (not to a processing facility) and segregated from healthy cows during loading and during transit. Additional care should be provided to cows that are weak or unhealthy during transport.

An adequate amount of time for the trip should be allotted to include periodic checking of the condition of the animals. Drivers should start and stop the vehicle smoothly and slow down for curves and corners. If an animal falls in transit, it should be helped to its feet, provided it does not pose a risk to the handler, and possibly segregated from the other animals for the rest of the trip. Provisions for water should be made immediately upon arrival at destination and provisions for feed should be made if the trip takes more than 24 hours. Feeding high-fiber dry feed for 48-to-72 hours before shipping reduces the moisture content of manure and improves air quality, animal comfort and hygiene. In best practice, all workers and handlers are properly trained in handling dairy animals and have a basic understanding of typical dairy cattle behavior. All state and national regulations regarding transportation should be followed.



To learn more about the National Dairy FARM Program, log on to
NATIONALDAIRYFARM.COM

or contact the National Milk Producers Federation at
(703) 243-6111
DAIRYFARM@NMPF.ORG



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