Chapter 1, Introduction

A long tradition of animal care enables dairy farmers to provide a healthy, safe and wholesome milk supply to the all consumers, both here in the United States but also around the world. Milk production is not just a profession; it is a way of life. Dairy farmers live and work on their farms and treat their cows with respect and care, knowing that this is the proper and humane thing to do for the animal and for their livelihood.

OVERVIEW

This reference manual communicates the animal care and wellness guidelines of the National Dairy FARM Program: Farmers Assuring Responsible Management™ (FARM Program). Along with the guidelines, this document provides extensive information, resources and references that dairy farmers can use. While extensive, the information, resources and references are not complete, 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 dairy farmers across the United States. Best practices identified in the manual are not the only practices that can meet the identified guidelines. Certain regional practices, weather, seasonal or other conditions may cause the application of some management practices to vary. Dairy farmers should work with their veterinarian or other trained professional to develop appropriate management approaches.

OUR MISSION

The FARM Program was created by the National Milk Producers Federation (NMPF), with support from Dairy Management, Inc. (DMI), to demonstrate and provide verification over time that U.S. dairy farmers are committed to providing a high level of animal care and quality assurance.

THE PROGRAM

Our customers and consumers want to know that dairy products are safe, wholesome and nutritious. They want to be assured that animals receive proper care. The FARM Program, voluntary and available to all dairy farmers, establishes an on-farm animal care program and a system for Third-Party Verification that demonstrates that commitment. Third-Party Verification ensures the integrity of the program to our customers and consumers. Our industry has an excellent track record of responsible management practices; this national effort strives to provide a continuous improvement process to ensure a high level of on-farm animal care and to provide reassurance to consumers that dairy farmers focus on dairy animal care. This manual details guidelines and best practices for a variety of animal care issues including animal health from birth to end of life, environment and facilities, nutrition, and handling, movement and transportation. The manual is an educational resource for dairy farmers, Second-Party Evaluators and Third-Party Verifiers participating in the FARM Program.

BACKGROUND

Consumers are more informed and educated about the nutritional benefits of their food now than at any time in history, but are more removed from production practices than ever before. With this lack of knowledge about how food is produced comes an increasing need to know that the animals that provide meat, milk and eggs are raised and cared for in a humane and ethical manner. The dairy industry,
through the National Milk Producers Federation with support from Dairy Management, Inc., responded
to this need for assurance by initiating the National Dairy FARM Program: Farmers Assuring Responsible
Management™ in 2009.

MANUAL FORMAT

The National Dairy FARM Program Animal Care Reference Manual is a comprehensive animal care
resource tool. It has been formatted for ease of use by providing guidelines for (1) nutrition, (2) animal
health, (3) environment and facilities, and (4) handling, movement and transportation. In each of these
chapters you will find a Management Checklist, a description of best practices, a section for specific
lifecycle considerations, and a list of other references and resources. Separate chapters cover the care of
newborns and milk-fed dairy calves, and special-needs animals. Management and training are recurring
themes throughout each chapter and are covered in the beginning of the manual.

The companion National Dairy FARM Program Animal Care Quick Reference User Guide is a condensed
version of the manual for on-farm use and implementation. These materials are supplemented with
additional educational resources for dairy farmers.

The FARM Animal Care Reference Manual, Quick Reference User Guides, Second Party Evaluation Form,
and educational templates are living documents—the guidelines are reviewed every three years and
subject to updating based on new, informative and science-based research on animal care and
wellbeing. This is part of the FARM Animal Care Program’s continuous improvement.

Additional information tailored for customers and consumers provides important communication about
the program through the dairy value chain. Two key elements of the National Dairy FARM Program are
the on-farm Second-Party Evaluations and the Third-Party Verification of the program. For program
participants this is a two-step process. The first step is the on-farm Second-Party Evaluation, which
provides the dairy farmer with an external review of animal care practices based on the FARM Program
guidelines. Once the Second-Party Evaluation step is complete the dairy farmer is eligible to be
randomly selected, through statistical sampling, to undergo Third-Party Verification. A more detailed
explanation of these two processes is provided in Chapter 2: On-Farm Second Party Evaluations and
Chapter 11: Third Party Verification. Additional information on the National Dairy FARM Program is
available online at www.nationaldairyfarm.com.

ACRONYMS

AABP American Association of Bovine Practitioners
ADT Animal Disease Traceability
AVMA American Veterinary Medical Association
BCS Body Condition Scoring
CAP Corrective Action Plan
DMI Dairy Management, Inc.
HAACP Hazards Analysis and Critical Control Points
NDFP National Dairy FARM Program
NMPF National Milk Producers Federation
SOP Standard Operating Procedure
TMR Total Mixed Ration
DEFINITIONS

For the purposes of the National Dairy FARM Program Animal Care Reference Manual, the following words found in the text are defined as follows:

Action Plan: A written proposal that identifies an area(s) for improvement in animal care. It specifies actions to make the improvement and a timeline for completion.

Animal Caretaker: Trained personnel responsible for the care and welfare of the animals on the dairy farm.

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 shelter, management, 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 Management Checklist Point.

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 (see Appendix A).

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.

Burdizzo: The Burdizzo castration method requires the use of a Burdizzo clamp to crush the blood vessels for 10 seconds, interrupting the supply to and destroying the testicle.

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

Corrective Action Plan: Written proposal that identifies an area(s) for improvement in animal care. It specifies actions to make the improvement and a timeline for completion.

Cow Care Agreement: An agreement signed by all employees with animal care responsibilities indicating the following: (1) that they have received training at least in basic animal handling and stockmanship; (2) that they agree to care for animals humanely and with respect and will not participate in animal abuse of any kind, and (3) that they will report any abuse to the farm owner or manager should they witness it. This document is signed at least once every three years.
Dehorning: Removal of the horn (using a hot iron, Barne’s dehorner or gouging) 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 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. End of Life: On-farm death due to illness, euthanasia or death at a packing house.

Employee Code of Ethics: A document which can be signed by all employees on a dairy, including employees that may not have direct animal care responsibilities, indicating their agreement to abide by the farm’s values and that any abuse of animals will be immediately reported.

 Freemartin Heifer: A sexually imperfect, usually sterile, female calf twinborn to a male. Growing Animals: The period of time 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.

Failure of Passive Transfer (FPT): The condition when calves don’t receive enough colostral immunity from the cow. The specific condition is defined in various ways by various professionals within species. 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.

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

Incision (Open/Closed Surgical Castration): A procedure where testicles are removed completely through an incision through the scrotum.

Lactating Dairy Cow: Any bovine female that has had her first calf.¹

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

Milking Cows: Cows that are lactating.

¹ This definition is written in such a way that allows FARM Program 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 Administrations’ 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.”
Milk-Fed Dairy Calf: A calf being fed milk or milk replacer (and not suckling from the dam) from newborn thru to weaning from milk.

Newborn: The young of the domestic cow, from birth through colostrum feeding, typically the first 48 hours of life.

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

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

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

Protocols: Written processes which 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 of on-farm animal care practices on a participating farm based on the National Dairy FARM Program guidelines.

Second-Party Evaluator: A trained dairy professional certified by the FARM Program to complete on-farm Second-Party Evaluations.

Special-Needs Animals: Sick, injured or non-ambulatory dairy cattle. Springing Heifers: A heifer that is in the last trimester 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.

Standard Operating Procedures: A document which provides specific instructions to cow-side personnel for performing a single, specific task. As a training tool, SOPs improve communication and work consistency.

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.

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

Waste Management: Management or handling of manure on the farm.

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

Willful Mistreatment of Animals: Acts that maliciously cause pain, injury or suffering including, but not limited to: needlessly applying any type of prod to a sensitive part of the animal (prods are only used when animal or human safety is in jeopardy, and as a last resort), malicious hitting or beating of an animal, movement of non-ambulatory cattle in a manner inconsistent with National Dairy FARM Program guidelines, prolonged lack of access to feed and water, and inappropriate on-farm slaughter or euthanasia.
Young Stock: Animals from weaning to 20 months of age.

Veterinarian of Record: 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.
Chapter 2: On Farm Second-Party Evaluations

The on-farm Second-Party Evaluation provides an external review of animal care practices based on National Dairy FARM Program guidelines. The results of the initial Second-Party Evaluation will provide dairy farmers with a status report and enable them to develop an action plan (in consultation with trained professionals) for continuous improvement if necessary. Subsequent Second-Party Evaluations, at least once every three years, will enable the dairy farmer to track progress in on-farm care of the animals. A veterinarian, extension educator, co-op field staff person, university personnel or otherwise qualified personnel who have completed National Dairy FARM Program training can perform Second-Party Evaluations. Second-Party Evaluators will use the Management Checklists provided in the National Dairy FARM Program to conduct the Second-Party Evaluation.

ACTION PLAN

At the conclusion of a Second-Party Evaluation an Action Plan is developed, if needed, by the dairy farmer and the herd veterinarian or other qualified professionals for those areas identified as needing improvement. An Action Plan identifies opportunity areas for improving animal care, specific actions to implement the improvement and a schedule for completion. An Action Plan may include a recommendation for a re-evaluation by a specified time to assess progress.

Action plans have been a part of the FARM Animal Care Program since its inception and may be implemented anytime the 2nd party evaluator believes it is warranted. Starting with this version of the FARM Animal Care Program, there are a few best management practices which will now trigger a mandatory action plan. These best management practices, which correspond to questions in the Second Party evaluation form, have been identified as “critical control points” by the experts of the FARM Program Technical Writing Group. These criteria are organized as follows:

Phase One

Phase 1 priority areas would be limited to:

- The dairy has a documented, written Veterinarian-Client-Patient Relationship (VCPR) that is affirmed at least annually or more often as needed.

- All employees with animal care responsibilities have signed a Cow Care Agreement at least once every three years (corresponds to FARM 3-year evaluation cycle).

- Tail docking stopped by January 1, 2017 and no animals entering the herd with docked tails effective January 1, 2020. *(This would allow for heifers that may have been docked off site as calves to re-enter the herd without undue discrimination).*

Farms that do not have a signed VCPR, signed Cow Care Agreement and/or are still Tail Docking will receive a mandatory Corrective Action Plan, as created by their co-op/processor and FARM Animal Care Program evaluator, with a set timeframe for re-evaluation, not to exceed one year’s time. On January 1, 2020 when Version 4.0 of the FARM Animal Care Program will be implemented, these requirements will become minimum criteria for FARM Animal Care Program participation.
Phase Two

Priority areas for Phase Two are four elements of a comprehensive, written herd health plan (not all of the elements of the herd health plan).

- Herd Health Plan (written with a Veterinarian)
  - The dairy has, as part of its written Herd Health Plan, developed in consultation with the herd veterinarian, *protocols for newborn and milk-fed dairy calves*.
  - The dairy has, as part of its written Herd Health Plan, developed in consultation with the herd veterinarian, *protocols for pain management*.
  - The dairy has, as part of its written Herd Health Plan, developed in consultation with a herd veterinarian, *protocols and training for non-ambulatory animal management*.
  - The dairy has, as part of its written Heard Health Plan, developed in consultation with a herd veterinarian, *protocols for euthanasia*.

Farms that do not have the aforementioned components of a comprehensive Herd Health Plan completed, will receive a Corrective Action Plan by their co-op/process or FARM Animal Care Program Evaluator. Upon re-evaluation, the farm must show improvement towards completing their Corrective Action Plan(s). On January 1, 2020 when Version 4.0 of the FARM Animal Care Program will be implemented, these requirements may be considered for Phase One implementation.

Ongoing Focus Areas

- Animal Observations
  - Ninety-five percent of the lactating and dry dairy herd scores a 2 or less on the NDFP Locomotion Scorecard.
  - Ninety-Five percent or more of lactating and dry dairy herd score a 2 or less on the NDFP Hock and Knee Scorecard.
  - Ninety-nine percent of all classes of animals score a body condition score of 2 or more on the NDFP Body Condition Score Scorecard.

If, during an evaluation, a farms does not meet the benchmarks for these animal observations, that farm will receive a Corrective Action Plan by their co-op or FARM Animal Care Program Evaluator. Upon re-evaluation, the farm must show improvement towards completing their Corrective Action Plan(s). These benchmarks are critical outcomes-based measures of animal welfare.

MANAGEMENT CHECKLISTS The Management Checklists provided in the following chapters highlight key on-farm guidelines and best practices. The Management Checklist Points will be highlighted in the following way at the start of a given section:

*Management Checklist Points are formatted in bold italics throughout the document.*
Chapter 3: Management

When addressing management, it is important to describe the procedure, train to the procedure, document the completion of the training and monitor it over time. Written SOPs are reviewed annually and considered a best practice. The written information would benefit another employee stepping in to assist. Train and educate animal caretakers about animal care expectations and animal well-being policies. The operation must have a written Herd Health Plan, as well as training and protocols for handling, transportation and movement, and euthanasia for cattle for all ages and health conditions. Much of the information in this chapter is interdependent on criteria in other sections and/or animal observations.

VETERINARIAN/CLIENT/PATIENT RELATIONSHIP

The dairy has a written Veterinarian Client Patient Relationship, signed by the farm owner/manager and Veterinarian of Record that is updated annually, or more often as needed. The Veterinarian Client Patient Relationship is one of the cornerstones of the FARM Program—upon which many other guidelines are based. A robust and intimate relationship with one’s veterinarian is crucial to safeguarding animal care.

To correctly diagnose, treat and prevent disease, dairy farmers must establish a Veterinarian Client Patient Relationship (VCPR) with a licensed Veterinarian of Record. According to the American Veterinary Medical Association (2013), a VCPR means that all of the following requirements are met:

1. The veterinarian has assumed the responsibility for making medical judgments regarding the health of the patient and the client has agreed to follow the veterinarian’s instructions.
2. The veterinarian has sufficient knowledge of the patient to initiate at least a general or preliminary diagnosis of the medical condition of the patient. This means that the veterinarian is personally acquainted with the keeping and care of the patient by virtue of:
   a. A timely examination of the patient by the veterinarian, or
   b. Medically appropriate and timely visits by the veterinarian to the operation where the patient is managed.
3. The veterinarian is readily available for follow-up evaluation or has arranged for the following:
   a. Veterinary emergency coverage, and
4. The veterinarian provides oversight of treatment, compliance and outcome.
5. Patient records are maintained.

Dairy producers are encouraged to consult and review the treatment protocols and antibiotic stewardship principles or programs, including the American Association of Bovine Practitioners “Guidelines for Establishing and Maintaining the VCPR in Bovine Practice” and the National Dairy FARM Program Milk and Dairy Beef Residue Prevention Manual, with their veterinarians (see resources section at end of Chapter).
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. The dairy producer or farm manager should ensure that any veterinarian providing antibiotics or protocols for their use on a farm notify the VOR for that farm. The dairy farmer in consultation with the herd Veterinarian of Record must develop a Herd Health Plan. A Herd Health Plan must be developed by the dairy farmer and the herd Veterinarian of Record.

TRAINING

Documentation exists of training for all new and existing employees with animal care responsibilities for stockmanship as well as their assigned animal care responsibilities (such as calf care, euthanasia, non-ambulatory cow management, etc.) at least on an annual basis.

A best practice is to train new animal caretakers on animal care, in their native languages, promptly after hiring. All animal caretakers should be retrained at least annually. Animal caretakers should be cross-trained for all situations they may encounter. Training encompasses 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 humanely handle animals. Animal caretakers must know and understand the negative consequences of deliberate disregard for animal care policies established by the dairy farmer. These animal care policies must be enforced by dairy farm management.

A complete list of training resources can be found at the conclusion of this Chapter and is also updated on the National Dairy FARM Website.

STANDARD OPERATING PROCEDURES

Written Protocols are readily available and translated, as needed, into the native languages of employees assigned animal care responsibilities.

Protocols are written instructions for various aspects of animal care on the dairy. The Protocols provide enough detail to ensure that all animal caretakers empowered with a specific animal care assignment (consistent with their job description and training) can routinely and consistently perform their animal care duties. As a best practice, SOPs are reviewed at least annually and updated as necessary. Written Protocols are required for the following management areas on the farm:

- Non-Ambulatory Cow Management;
- Euthanasia
- Transport
- Emergency Preparedness/Response
- Biosecurity
- Calf Care/Calving Management (including care of the newborn); and
- Painful Procedures (including disbudding and castration).

Sample written Protocols are available from the FARM Program.

EMERGENCY PREPAREDNESS
The names and telephone numbers for emergency services, emergency contacts (e.g., the owner, veterinarian, milk handler, equipment dealers and Power Company), and the site address are posted in a prominent place on the farm in the employee’s native language(s).

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 communications in an emergency.

IDENTIFICATION AND RECORD KEEPING

Each animal is permanently identified

An effective record-keeping system is employed for animal care and management decision making.

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 (IDairy 2009). 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 (animal disease traceability rule). Under the ADT final rule, all dairy cattle females, regardless of age, and all male dairy cattle (including dairy steers) that are born after March 11, 2013, will be required to be officially identified (by a device or method approved by USDA) prior to interstate movement. Additionally, all dairy cattle moving between states (unless transporting to slaughter) must be accompanied by an Interstate Certificate of Veterinary Inspection or other documentation as agreed to by the receiving state. The FARM Program recommends using 840-RFID ear tags, which USDA recognizes as an official identification device for the lifetime of an animal. Effective record keeping shows compliance with training, inventory control, animal identification, disease prevention and control, residue withdrawal and avoidance, and disposal to help avoid liability from residue contamination or other animal health concerns. On a daily basis, it is necessary to identify animals treated with medications or healthcare products. Records are important for animal traceability in the event of an animal disease outbreak. They may include such items as:

- Birth date
- Sex
- Origin
- Owner
- Location

Production and reproduction records help monitor an animal’s performance and well-being. Important management information may include:

- Average daily weight gain for heifers and yearlings
- Milk production and composition
- Nutritional information and history where known
Breeding dates
• Sire identification and calving dates
• Identification of the calf
• Ultimate disposition of the animal

Equally important animal health information that may be recorded:
• Vaccination dates
• Parasite control measures
• Blood tests and veterinary treatments, including:
  • Treatment date(s)
  • Name of medication(s)
  • Amount(s) and route(s) of administration
  • Surgical procedure(s) performed
  • Condition diagnosed and being treated
  • Veterinary clinic information

MILKING ROUTINE

A specific milking routine, procedures and actions are followed to ensure low stress handling and well-being.

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 (see Chapter 8: Animal Handling, Movement and Transportation), thus all animal caretakers should behave in a calm and controlled manner. Milkers should be trained to load cows into the parlor in accordance with the stockmanship principles outlined in Chapter 8.

Specifically:
- Cows should be moved without the use of sticks or prods and with the minimum evidence of vocalization by the animals. Animal caretakers should walk close to the incoming line of cows, in the opposite direction to cow flow and follow a return path as far from the incoming cows as possible.
- Gates and restraining equipment operate smoothly, quietly and safely. Waiting time is minimized for each milking.

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 the farms with the milking parlors is the place of highest animal density on the farm. It is important that prevention of injury 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 (see Chapter 7: Environment and Facilities).

The preparation routine that signals the beginning of milking is consistent and as low stress to the cow as possible. The routine includes 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. Teat ends are periodically inspected to facilitate timely identification of any problems.

Milking equipment is regularly maintained and checked for vacuum level, pulsation rate and pulsation ratio. Equipment is also checked for stray voltage if unusual behavior is exhibited or milk production drops. To prevent disease transmission, milking equipment is maintained, cleaned and sanitized.

RESOURCES
- AABP Guidelines for Establishing and Maintaining the VCPR in Bovine Practice (accessed by AABP members at http://aabp.org/resources/aabp_guidelines/vcprguidelinefinal11-2013.2.pdf) – farms may become certified by an accredited veterinarian and complete a six-step program to ensure food safety and responsible medication use.
- “Introduction to Dairy Stockmanship.” Dairy Care365™ Training Series. (Merck Animal Health, 2012) To request a copy email: Info@DairyCare365.com “Moving Cows to the Milking Parlor”. Dairy Care365™ Training Series. (Merck Animal Health, 2013) To request a copy email: Info@DairyCare365.com
Chapter 4: Newborn and Milk-Fed Dairy Calves

Inadequate colostrum intake results in “failure of passive transfer” (FPT). Under best practice, all calves receive colostrum or colostrum replacer and are fed in a way that promotes health and reduces the risk of disease. Colostrum quality is highly dependent on early harvest (within two hours of calving). Calf health is maintained through preventive care programs augmented by rapid diagnosis and treatment when necessary. Animal caretakers are adequately trained to follow established protocols. Calves are provided space to stand, lie down, adopt normal resting postures and have visual contact with other calves, provided an environment that is clean, dry, and minimizes exposure to drafts and seasonal weather extremes. Calves are handled, moved and transported in a manner that minimizes the risk of the potential for injury, distress or disease.

NUTRITION

All calves receive colostrum or colostrum replacer soon after birth, even if immediately transported off the farm.

Calves receive a volume and quality of milk or milk replacer to maintain health, growth and vigor until weaned or marketed.

All classes of animals (including milk-fed dairy calves) have access to clean, fresh water as necessary to maintain proper hydration.

Calves are offered fresh, palatable starter feed.

Identified animal caretakers are trained in calf care nutritional requirements, including use of esophageal tube feeders and other feeding mechanisms.

Colostrum feeding has an important influence on the health and well-being of calves (Davis and Drackely 1998). Calf care and feeding should be based on the counsel of a qualified nutrition professional as well as the herd veterinarian. Calves should receive 4-5 quarts of colostrum (3 to 4 quarts for smaller dairy breeds) from a cow’s first milking in one or two feedings within the first 6 to 8 hours of life. Blood-serum concentration of immunoglobulin G (IgG) less than 10.0 grams per liter (g/L) (McGuirk and Collins 2004) or serum total protein less than 5.5 grams per deciliter (g/dL) have been equated with poor growth rates and increased prevalence of sickness and death.
Monitoring colostrum quality before feeding (e.g., colostrometer) is considered best practice (Bartier et al., 2015). Effective colostrum replacements provide at least 100 grams, 150 to 200 grams preferred, of IgG. In addition, ensuring that Ig concentrations in the blood are sufficient is an effective way of evaluating colostrum management practices.

**Esophageal Feeding:**

An esophageal tube feeder may be used by trained animal caretakers to administer colostrum. Proper cleaning and sanitation of the feeder between calves is essential. After receiving immunity through feeding colostrum or colostrum replacer, calves are fed milk or milk replacer through weaning. The recommendations for colostrum feeding, according to Drackley 2008, are:

1. The calf receives four quarts (or 10 percent body weight) of high quality colostrum or colostrum replacer within the first few hours of birth.
2. The Ig content of the colostrum is of high quality (over 50mg/ml) (Godden et al., 2008). This equates to a Brix value greater or equal to 22% according to Bielmann et al. (2010).

To ensure good colostrum management practices dairy farmers are encouraged to work with their veterinarian to assess failure of passive transfer.

**MILK AND MILK REPLACER FEEDING**

During the first weeks of life, solid feed intake is very low in calves, regardless of the amount of milk or starter provided. In addition to milk, water is provided from the first day of life. Calves benefit especially from higher milk/milk replacer intakes during the first four 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 (Khan et al., 2011). Calves are motivated to consume large amounts of milk or milk replacer equivalent (for example, Holstein calves will drink in excess of eight quarts per day or more in two or more feedings per day). Feeding only four 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 (de Paula Vieira et. al 2008). There are no known negative side effects of feeding more milk/milk replacer.
There are long-term benefits such as earlier breeding ages and higher milk yield later in life when calves are provided higher planes of nutrition during the first four weeks of life (Soberon et al, 2012).

Higher milk intakes will result in looser feces but this is not associated with increased diarrhea or other health problems. In addition, delivering larger amounts of milk (eight quarts per day or more in two or more feedings per day) via nipple feeding (rather than a bucket) is more natural and results in higher concentrations of digestive hormones such as cholecystokinin and insulin (de Passille et. al 2001) and is considered a best practice. In group housing situations, provision of 20% body weight equivalent in milk from a nipple feeding system can reduce or in many cases eliminate cross sucking, depending on competition for access to nipples (see Chapter 7: Environment and Facilities).

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.

A clean environment will help limit the influence of infectious agents (bacteria, viruses and protozoa) on calf growth. Steps should be taken to limit calves’ ingestion of manure and the infectious agents it may carry (but not at the expense of providing bedding). Cold stress weakens the immune system, so avoiding stress is important to disease prevention.

The optimal amount of milk/milk replacer will vary with a number of factors. For example, the environment can have a substantial impact on calf growth. Special attention to cleaning all calf-feeding equipment is necessary for calf health. Caution is 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.

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.

See: “A Guide to Modern Milk Replacers (Bovine Alliance on Management & Nutrition, 2014)” for guidance on choosing a milk replacer. Good milk replacer mixes easily in warm water and stays in solution after mixing. Water used with milk replacers needs to be fresh, palatable and free of contaminants. Animal caretakers take care to use the appropriate weight of powder, and volume and temperature of water to ensure consistency when mixing milk replacers. Remember:

- Start introducing small amounts of fresh, palatable, high-quality starter feed on day 3 and increase the amount offered as the calf consumes more over time based on the advice of a qualified nutritionist;
- Transition weaned calves with as little dietary and handling stress as possible. Do not abruptly wean, instead consider reducing milk allowance over a 5 day period leading up to weaning.
It is commonly thought that feeding less milk will encourage solid feed intake and thus facilitate weaning. Indeed, feeding calves less milk does increase starter consumption, but this practice also severely limits weight gains (reviewed by Khan et al., 2011). To date there has been little information available on how best to wean rapidly growing calves fed high milk rations. New work is showing that slowly reducing milk intakes in the days before weaning can be helpful (Khan et al., 2007). Diluting the milk with water or slowly restricting the amount of milk can successfully achieve gradual weaning; this will increase starter intake and minimize the growth check at weaning (Khan et al., 2011). Gradual weaning over a 7- to 10-day period is preferred. From an animal welfare perspective abrupt weaning of calves from milk to solid feed can lead to deleterious consequences, including increased cross-sucking, signs of hunger (Nielsen et al., 2008) and reduced weight gains (Sweeney et al., 2010).

Adjust milk or milk replacer and ration to account for energy availability to environmental extremes as necessary. Calves will become cold stressed at 50- 60 degrees Fahrenheit, requiring extra energy for growth and maintenance.

Calves should have access clean, fresh water to maintain proper hydration from the first day of life. Feeding milk or replacer should not be a substitute for water (Vasseur et al. 2010); best practice is to provide calves access to water beginning on the first day of life.

REFERENCES


Is Colostrum the Key to Lifetime Profitability? by Connie Eibergen | Oct 17, 2013


Chapter 5: Nutrition

As a best practice, animals have access to adequate feed and water on a daily basis, in a consistent manner, on a regular schedule and according to their specific requirements. Rations provide the required nutrients for maintenance, growth, lactation, health and pregnancy (based on an animal’s life stage). Nutritional management is greatly improved when dairy farmers take the time to observe their animals to maintain uniform groupings, and give attention to animals that are underperforming. In best practice, body condition scoring is used to monitor the energy balance and nutritional condition of the herd.

WATER

All classes animals (including calves) have access to, clean, fresh water as necessary to maintain proper hydration.

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. Under best practice, waterers are convenient for the animals to reach on demand, and there are sufficient waterers (number, size and capacity) to accommodate the number of animals in the group. When continuous access is impossible for other classes of animals besides lactating cows and non-lactating cows, water must be made available to allow animals to drink to satiation at least twice per day (more often under heat stress conditions). In best practice, water is prevented from freezing in cold weather or animals are provided access to fresh water as soon as possible. See Table 1 for the estimated water consumption of dairy cattle. FEED Rations provide the required nutrients for maintenance, growth, health and lactation for the appropriate physiological life stage. For calves, feeding milk or replacer should not be a substitute for water (Vasseur et al. 2010); best practice is to provide calves access to water beginning on the first day of life. Feed equipment is washed and disinfected after being used for non-feed purposes. Sufficient feed bunk space is provided that allows all animals to feed at the same time or sufficient quantities of feed are available for all animals during a 24-hour period.

Always provide multiple sources of plentiful drinking water located in accessible alleys with sufficient drinking space. Other considerations include:

- Compare measured water intake to predicted requirements for the level of productivity;
- Locate drinking water troughs near feed troughs and near stalls;
- Monitor water cleanliness and clean water troughs as necessary;
- Provide access to water in return alleys from the milking parlor to promote consumption immediately after milking.
Feed considerations include nutritional quality and quantity, feed bunk design and proper feed storage. Advances in ruminant nutrition and feeding behavior science have greatly improved our understanding of dairy cattle production.

As a best practice, dairy farmers monitor feed quality and nutrient content of feed components and provide adequate bunk space to allow all animals to feed simultaneously. Feed for other species is never mixed with dairy animal feed. As a best practice, the dairy farmer evaluates protocols to assure that feeding programs meet the basic nutritional requirements for the animals’ maintenance, growth, production, health and reproduction. Qualified nutritional consultants normally assist in formulating rations that economically meet nutritional requirements of animals.

Managers:
- Check that feed and feed ingredients are carefully mixed and formulated according to the animals’ dietary needs based on the counsel of a qualified nutrition professional using dairy nutrition models. Adjust rations and water availability conditions
- Periodically assess dry matter intake;
- Adjust rations to assure the correct content of protein, energy, fiber, macro-minerals and micronutrients in feed whenever forages are changed;
- If conditions warrant, check homegrown or purchased feed ingredients and commodities for nitrates, mycotoxins and other soil- or climate-induced problems, adjust diets to provide for production level and check feed quality to see if it matches the manufacturer’s statement;
- Check dry matter of wet feeds such as silages often and whenever large variations are noticed or anticipated.

The daily removal of feeds not consumed will ensure freshness of feed, prevent mold and spoilage, and aid 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. In best practice, feeders are far enough from any
water source to minimize contamination of water. For example, sprinklers point away from the feed bunk to avoid adding moisture to the total mixed ration (TMR). Feed is pushed up several times daily (see special considerations for milking cows below for details about feed access). Sanitation of eating areas will improve if animal caretakers check them several times each day and remove any feed not eaten daily.

Safely store bulk supplies of feed in appropriately designed areas to avoid moisture, vermin, and bacterial or fungal contamination. Proper labeling of storage containers or areas, controlling moisture, and using an effective program of vermin control 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

Mycotoxins are secondary fungal metabolites that are toxic to animal and humans. Mycotoxin producing molds are ubiquitous in nature and thus mycotoxin contamination of feeds and foods is a potential consequence of normal mold plant interactions. (Duarte Diaz, A to Z Mycotoxins) Economic losses associated with mycotoxicoses include:

- reduced milk production
- potential for contaminated/adulterated milk (aflatoxin)
- poor fertility
- increased somatic cell count (SCC)
- increased disease susceptibility
- reduced longevity

<table>
<thead>
<tr>
<th>Mycotoxin</th>
<th>Fungal species producing toxin</th>
<th>Symptoms observed for ruminants consuming the toxin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aflatoxin</td>
<td>Aspergillus flavus &amp; A. parasiticus</td>
<td>Clinical signs of acute aflatoxicosis include anorexia, lethargy, ascites, icterus, tenesmus, and bloody diarrhea. Liver damage is a constant finding. Subacute signs include decreased performance related to anorexia, deranged hepatic protein and lipid metabolism, altered hormone metabolism, and immunosuppression.</td>
</tr>
<tr>
<td>Deoxynivalenol (DON, vomitoxin)</td>
<td>Fusarium graminearum</td>
<td>To date, naturally occurring concentrations of DON have failed to cause any discernible effects in cattle or sheep.</td>
</tr>
<tr>
<td>Fumonisin</td>
<td>F. moniliforme</td>
<td>A recently discovered mycotoxin, which affects horses more than ruminant animals.</td>
</tr>
<tr>
<td>Ochratoxin A</td>
<td>A. Ochraceus Penicilium varienscum</td>
<td>Domestic ruminants can detoxify this compound in the rumen; however, this ability may be reduced for animals on high concentrate diets. Ochratoxin A is a nephrotoxin (causes kidney damage).</td>
</tr>
<tr>
<td>T-2</td>
<td>F. sporotrichioides</td>
<td>A field report has attributed anorexia, bleeding and diarrhea to T-2 consumption in cattle. Young ruminants are more susceptible than adults.</td>
</tr>
<tr>
<td>Zeaalenone</td>
<td>F. graminearum</td>
<td>Cattle and sheep are less susceptible than swine due to rumen degradation and rapid conversion in the liver. May interfere with reproductive function in some animals.</td>
</tr>
</tbody>
</table>

Newborn and Milk-Fed Dairy Calves Health Monitoring during the first 12 weeks of life is especially important as this is a period when calves are particularly vulnerable. Providing a solid foundation will ensure that the calves will grow, develop and eventually mature into healthy productive lactating dairy cows. Providing adequate nutrition early in life has been shown to provide long-term benefits for heifers, such as earlier breeding ages and higher milk yield later in life (Soberon et al., 2012). For more information refer to Chapter 4: Newborn and Milk-Fed Dairy Calves.

Growing Animals: Providing appropriate nutrition to the growing dairy heifer is key to ensuring a successful dairy replacement strategy for dairy operations. Provide adequate bunk space that allows all heifers access to a nutritionally balanced diet at the same time. The recommended space at the feed bunk is 18 inches/head for heifers 6- to 12-months of age, 20 inches for calves 12- to 18-months, and 24 inches for heifers over 18 months of age (Dairy Calf & Heifer Association, 2012). These recommendations are believed, without direct empirical evidence, to allow heifers to feed simultaneously and, thus, reduce feed bunk competition. Competition for feed reduces feeding time (See review by DeVries, 2010) across feeding strategies. Changes in feeding patterns associated with competition also increased the risk of heifers experiencing low rumen pH and associated effects on rumen health. Finally, competition for feed in dairy heifers also increases variability in weight gain between heifers.

Milking Cows: There are several aspects of the feeding environment that affect the cow’s ability to access feed, including the amount of available feed bunk space per animal and the physical design of the feeding area (reviews by von Keyserlingk and Weary 2010; Cook and Nordlund, 2004). Competition is significantly reduced when cows are fed using a headlock barrier compared to a post and rail barrier. As well, regardless of barrier type, stocking density affects feeding time. Cows spend less time feeding and fight more when overstocked. These effects are greatest for the subordinate cow, particularly at high stocking densities at the feed bunk. Fighting for access to feed has also been shown to increase dramatically when cows are fed to an empty bunk (Collings et al., 2011). Adequate space and time to access feed is essential to minimize feed bunk competition in group housing systems. There is considerable scientific evidence indicating that the provision of adequate feed bunk space during the transition period (three weeks before to three weeks after calving) is particularly important (see review by von Keyserlingk and Weary 2010). Highly competitive feeding areas can significantly reduce feed intake before calving, which has been associated with increased risk for post-partum disease (e.g. metritis, sub-clinical ketosis) (reviewed by Sepulveda et al., 2013). Management of transition cows requires special consideration of the environmental and social factors that influence these behaviors. In best practice, transition cows have at least 30 inches of bunk space per cow and all other lactating cows at least 24 inches per cow.

Dry Cows: A substantial body of evidence now exists indicating that overcrowding during the pre-partum period can have detrimental effects in terms of post-partum health (reviewed by Sepulveda-Varas et al, in press). In best practice, dry cows, particularly in the three weeks before calving, have at least 30 inches of bunk space per cow. Provide sufficient and plentiful water located in easily accessible areas with sufficient space. Monitor water cleanliness and clean water troughs as necessary.
SIDEBAR Content: Feed Traceability

Have the ability to track any feed ingredients, milk production, dairy beef or substance that will be used for consumption, through all stages of production, processing, and distribution (Official Journal of the European Union, 2002). Internal and external dairy feeds and production traceability is important. Monitoring all feed ingredients and additives as they are delivered, processed, mixed within a facility.

REFERENCES


RESOURCES

Chapter 6: Animal Health

A good husbandry and animal care program on a dairy is essential to the health of the cattle. One of the foundations for animal care is to prevent or minimize pain, injury and disease. Disease is minimized by adherence to herd health, nutrition and management programs that enhance well-being. If disease is present, rapid diagnosis and treatment is instituted. A dairy maintains the health of the cattle by providing appropriate nutrition, housing, and disease prevention and detection, along with well-designed treatment programs. These programs are developed through consultation with a licensed veterinarian.

HERD HEALTH PLAN

An effective written Herd Health Plan emphasizes prevention, rapid diagnosis and quick decision making on necessary treatment of all sick or injured dairy cattle on the farm. A licensed veterinarian can help dairy farmers develop and implement a routine Herd Health Plan. A sample Herd Health Plan is available at www.nationaldairyfarm.com. Even with the best management and prevention programs, animals can become sick or injured. Identification is key to detecting health issues early in order to provide effective treatment.

The dairy has a written Herd Health Plan, developed in consultation with the Veterinarian of Record, to prevent, treat and monitor incidence of common diseases (which may include mastitis, metritis, metabolic diseases (e.g. milk fever, ketosis)displaced abomasum, pneumonia and infectious diarrheas,

- The written herd health plan includes the following elements: Veterinarian/Client/Patient Relationship. (See Chapter 3: Management – Protocols, Training and Record Keeping)
- Vaccination protocols that specify age class, product and route of administration.
- Daily observation of all cattle for injury or signs of disease by trained employees.
- Protocols for newborn calf management. (See Chapter 4: Newborn and Milk-Fed Dairy Calves)
- Protocols for the management of cattle that develop disease or are injured. This should include protocols for managing pain in all applicable age classes.
- Protocols for managing dystocia (difficult calving).
- Protocols for parasite and pest control including protocols for fly control.
- Protocols for non-ambulatory animal management that include 24 hour access to food, water and shelter/shade. (See Chapter 9: Special Needs Animals)
- Protocols for euthanasia that align with the methods approved by the American Association of Bovine Practitioners and the American Veterinary Medical Association and provides for confirmation of death. (See Appendix B)
- Protocols to prevent lameness.
- Treatment protocols that specify age class, product and route of administration to ensure food safety, including proper milk and meat residue withhold times as well as definitions of what cattle are eligible to be marketed.
- Written protocols for culling and transporting dairy animals, developed in consultation with the herd veterinarian.
Procedures for recording of disease and treatment as well as mortalities and their cause (e.g. euthanasia, toxic mastitis, pneumonia, etc.)

Documented evidence of training programs for employees with animal care responsibilities involved in detecting disease and injury, which include recording the cases and actions to be taken.

The Herd Health Plan is reviewed and updated annually. This shall be documentable by having all protocols and procedures carry the date of review on them.

NEWBORN AND MILK-FED DAIRY CALVES

The dairy has a written Herd Health Plan, developed in consultation with the herd veterinarian, which includes specific areas pertaining to newborn and milk-fed dairy calves.

Topics in the Herd Health Plan relevant to newborn and milk-fed dairy calves include colostrum management, navel dipping, identification and record keeping, and protocols for vaccination, dehorning, supernumerary teat removal, castration, tail docking (to be phased out by January 1st, 2017) and euthanasia as well as documented protocols of handling practices for calves.

Navel Dipping

Dip navels in disinfectant as soon as possible after birth. Wet cords are entry points for pathogens into the calf’s body. In best practice, calves designated for slaughter or sale should not be shipped without first dipping navels. Calf naval dipping should be addressed in the farm’s protocols for newborn and milk-fed dairy calves.

PAINFUL MEDICAL PROCEDURES

Certain painful procedures are necessary to ensure the safety of the workers and the animals on the farm. Dairy farmers should work with their licensed veterinarian to develop protocols that minimize any negative effects associated with the procedure including pain and stress resulting from the procedure or animal handling. In addition, any animal caretaker responsible for performing the procedure should receive adequate training to maximize safety for the animal and the caretaker.

Calves are disbudded by eight weeks of age.

Pain mitigation is provided for disbudding or dehorning in accordance with the recommendations of your herd veterinarian.

All other planned medical procedures, including castration and extra teat removal, are performed at the earliest age possible.

Other planned medical procedures are performed using pain mitigation in accordance with the recommendations of your herd veterinarian.
Disbudding and Dehorning:

These procedures are performed for the safety of cattle and their caregivers (AVMA, 2012). 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 is thought to occur around 8 weeks of age (Stafford and Mellor, 2005).

Best practice is to do this procedure (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 (Graf and Senn, 1998; Doherty et al., 2007), non-steroidal anti-inflammatory drugs (NSAID) (Heinrich et al., 2010; Huber et al., 2013), and sedatives (Faulkner and Weary, 2000; Hokkanen et al., 2014) all have been shown to provide benefit to calf welfare. We recommend developing an effective pain management protocol with your veterinarian.

Caustic paste can also be used to perform disbudding (Vickers et al., 2005). This method also causes pain, but less is known about the degree of pain or how long it lasts. Additional management for paste disbudding, such as protecting treated calves from rain and limiting social interactions to ensure paste only affects the horn bud area are considered in best practice.

As a best practice for dehorning, cows that have either been missed or have developed scurs are monitored and, if deemed necessary, the bulk of the horn is removed to prevent horns from growing into the skull and to prevent a growing horn from injuring other cows. Any attempt to permanently remove the horn at greater than 8 weeks of age is considered a surgical procedure and should be performed by or in consultation with a licensed veterinarian.

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

Castration: Castration is performed to stop the production of male hormones and semen to prevent unwanted mating. In addition, castration produces cattle that are easier to handle or less aggressive, which promotes animal and human safety. There is scientific evidence that castration is acutely painful regardless of the method used (Stafford and Mellor, 2005) and some form of pain management in accordance with the recommendations of the herd veterinarian is required.

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

Although banding results in little 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. There are anecdotal concerns that have been voiced for each of these methods. Some surgical incision sites can become
infected and require medical intervention, including antibiotics. Castration with Burdizzo is highly dependent on the skill of the operator and thus not always successful. When these two approaches have been compared under controlled studies, the results are mixed and are dependent in part on the age of the animal. 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. Castration should occur at the youngest age possible and, regardless of the age of the calf or the procedure performed, the immediate pain must be managed following pain control protocols agreed upon by the dairy farmer and the herd veterinarian.

**Branding:** In some cases branding is required by state law or to prevent theft and assure ownership. 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 (Schwartzkopf-Genswein et al., 1997). In consultation with the herd veterinarian, branding may be done concurrently with dehorning and castration in order to take advantage of long-term pain relief provided for these procedures. 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 at all possible. Brands must never be applied to the face for on-farm ID purposes.

**Extra Teat Removal:** In best practice, extra teats are removed at the youngest age possible to minimize the amount of tissue damage and the vascularization of the area. The removal of extra teats can also be addressed concurrently with disbudding to have the animals benefit from the pain relief provided at that time. Ideally, a dedicated set of sharp scissors or scalpels are used when performing this procedure. This procedure is performed using pain mitigation in accordance with the recommendations of your herd veterinarian.

**Tail Docking:** The National Dairy FARM Animal Care Program opposes the routine tail docking of dairy animals, except in the case of traumatic injury to an animal. This practice is recommended to be phased out by January 1, 2017. Current scientific literature indicates that routine tail docking provides no benefit to the animal or quality of the milk (reviewed by Sutherland and Tucker 2012). 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 a recommended alternative.

**Euthanasia:** At times, euthanasia may be necessary to humanely deal with complications from birth or other conditions. Euthanasia protocols should be consistent with recommendations from the American Association of Bovine Practitioners and the American Veterinary Medical Association (see Appendix B).

**SIDEBAR CONTENT: PAIN MANAGEMENT TECHNIQUES**
ANIMAL OBSERVATIONS

One of the key components of the FARM Program are the animal observations recorded during the Second-Party Evaluation. Viewing the animals is the best way to evaluate outcomes from animal care practices on the farm. Second-Party Evaluators are trained to score animals in four areas – hygiene, locomotion, body condition score and hock and knee lesions. The guidelines that follow are based on review of the extensive data, obtained by analyzing the Second-Party evaluations, in all the observation areas and the opinion of experts in dairy cattle care. Thresholds are set based on consensus among a group of experts and available research data. The thresholds are revisited every three years.

HYGIENE

Ninety percent or more of all animals in all pens score 2 or less on the NDFP Hygiene Scorecard (1 is clean, 4 is dirty). (See Appendix C)

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

- Minimize animal disease through clean facilities
- 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, and emptying waste containers. Facilities are free of standing water, excess manure, unnecessary farm items and clutter. Feed and bedding is clean and dry, even in areas with minimal housing and rainfall. Animal caretakers maintain a level of cleanliness to minimize the spread of pathogens. If a serious, specific pathogen has been identified, it is best to consult with your veterinarian on the most appropriate sanitation process to use. This is likely to include disinfection of the animals’ immediate environment and thorough cleaning of enclosed housing facilities, followed by chemical disinfecting. 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 is removed regularly from facilities and freestalls, and walkways are clean and have good traction. In addition to affected 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.

LOCOMOTION

Ninety-five percent of the lactating and dry dairy herd scores a 2 or less on the NDFP Locomotion Scorecard (1 is sound, 2 is moderately lame, 3 is severely lame). (See Appendix D)

A lameness prevention protocol is in place.

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
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, limits the exhibition of estrus and influences general health.

Lameness may be reduced, improving cow comfort, (e.g. standing and lying surfaces; Chapinal et al., 2013) by preventive hoof trimming performed to both balance weight bearing between the claws and restore a more upright foot angle, 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 minimizing time out of the pen milking to less than 3 hours per day, avoiding overstocking and providing an appropriate thermal environment. Other steps include providing adequate heat abatement in hot weather, shelter in cold weather, and ample dry, comfortable bedding (see Chapter 7: Environment and Facilities).

BODY CONDITION SCORING (BCS)

Ninety-nine percent of all classes of animals score a body condition score of 2 or more on the NDFP Body Condition Score Scorecard (1 is thin, 5 is fat). (See Appendix A)

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 is 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. Cows with a BCS less than 2 should be evaluated for fitness to transport.

HOCK AND KNEE LESIONS

Ninety-five percent or more of lactating and dry dairy herd score a 2 or less on the NDFP Hock and Knee Lesion Scorecard (1 is no hair loss/swelling, 2 is some hair loss; no swelling, 3 is severe swelling and/or abrasion through hide). (See Appendix E)

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. Unlike lameness, hock lesions can be easily assessed in the milking parlor (von Keyserlingk et al., 2012). A healthy hock is free from hair loss (the hair coat is smooth and continuous with the rest of the leg) 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 US 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 (Barrientos et al., 2014; e.g. von Keyserlingk et al 2012).

The scoring for the FARM Program focuses on the animals afflicted by significant hock and knee injury involving swelling of the joint and/or ulceration of the skin. The target is 5 percent or less.

**Body Abrasions and Injuries**

Under best practice, cattle are housed in environments that prevent body abrasions and injury. Often, the location of a given injury can provide insight into where the problem lies. For example, obvious swelling on the neck can be caused by inappropriate feeder design, where the overhead rail traumatizes the tissue and causes severe swelling. The tail must not be used to move or restrain a cow in such a way that the tail becomes injured or broken, as this is a sign of inhumane handling. Abrasions can also be the result of aggressive interactions with other animals and, even in some cases, from health measures such as injection-site abscesses. Specifically, horned animals can cause body abrasions and severe injuries to both other cows and farm employees. By monitoring the location and prevalence of these injuries across the entire herd, management will be able to identify and address specific problems, in consultation with their veterinarian. Best practices require that information is known about the importance and meaning of injuries to the legs, specifically hock and knee injuries, thus, these injuries are given a dedicated sub-section.

The FARM Program has reviewed the data collected over the last three years and has determined that no guideline for body abrasions needs to be developed.

**Pest Control**: Pest control is part of a herd health program because vermin transmit diseases and interfere with the animals’ comfort. Under best practice, dairy farmers adopt procedures to control flies, mosquitoes, lice, mites, ticks, grubs, fleas, rodents, skunks and pest birds (e.g., starlings, pigeons and sparrows). Exercise particular caution to avoid contaminating feedstuffs, 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. In some regions, rabies and other diseases are spread to dairy animals by skunks, raccoons, foxes, bats and other wildlife. If cats and dogs are kept on the facility, be certain that their rabies immunization status is current and protocols are in place to minimize flea infestation, as fleas can kill baby calves (Parasites and Pests—Management for 1038 Profit, 2000).

**SPECIFIC LIFECYCLE CONSIDERATIONS**

**Breeding Bulls**:

Breeding bulls require the same level of care and management as any other class of animals on the dairy. If the dairy elects to keep bulls for breeding purposes, they need to be included in the dairies' procedures/protocols and there should be specific areas on bulls included in the documentable stockmanship training for employees. Consult with your veterinarian for further specific details on breeding bull management.
REFERENCES


RESOURCES


Chapter 7: Environment and Facilities

Proper management of the housing environment has been linked to improved animal performance and overall well-being. Facilities include all housing structures, handling structures, lots, pens, stalls, alleys and pastures that are inhabited by cattle of any age and health status. Facilities provide sufficient protection from temperature extremes and ensure the safety and care of the animals.

ANIMAL ENVIRONMENT

Temperature and Humidity:

Protection from heat and cold are provided for all age classes

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’s age, sex, weight, adaptation status, activity level, posture, stage of lactation, body condition and diet.

The Thermoneutral Zone (the range of temperatures between which the animal does not need to expend energy to stay warm or to cool) for newborn calves is 50-78°F, while for a month old calf and for adult cattle it is typically 32-73°F. Except for newborn calves, cattle are therefore quite cold tolerant. However, compared to humans, cattle become heat stressed at lower temperatures. In order to account for the impact of both temperature and relative humidity (the water carrying capacity of air), best practice is to utilize the Temperature Humidity Index (THI) and begin heat abatement measures at a THI of 65-72 (Kendall et al., 2007; Bryant et al., 2007).

When facing cold conditions, cattle (including calves) are provided with adequate feed to maintain body condition and protection from wind and moisture. In the case of the newborn calf, under one month of age it is important to shield the calf from drafts—typically defined as air speeds of more than 50ft per minute. Provisions of dry bedding are preferred by the milk fed calf (Camiloti et. Al, 2012) and are essential in cold weather climates. Higher milk feeding rates are required to supplement calories for growing calves (see review by Khan et. Al 2011) and a deep bed of straw is recommended for “nesting.” Clean calf jackets may also be used as a supplement to these strategies. Any loss of body condition pre-weaning would be an indication of a failure to provide sufficient warmth and calories for this important group.

Under conditions of heat stress, at above a THI of 65, producers should provide heat stress mitigation strategies which function without the need for human activation. These strategies may include:

1. Shade: Cattle prefer and appear motivated to use shade (Schutz et. Al 2008) and will readily do so when solar radiation increases (Tucker et al., 2009). Shade is the first step in heat abatement. A best practice is for all animals to have access to shade that allows simultaneous use by the entire group to minimize competition.
2. Water for drinking: 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) (Huzzey et. al. 2007). Little research exists on this topic. Recommendations based on practical experience suggest that under housed conditions at least 2 waterers are recommended per group with at 2 to 3.5” 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 in case of a bowl and 5 to 7 gallons/min in case of a trough.

3. Air movement; Air movement speeds of 200-400 ft per min are required for optimal cooling (Berman, 2008). Mechanical ventilation systems (tunnel and cross ventilation) and use of supplemental recirculation fans in parlor holding areas, in pens in naturally ventilated barns and under shades in dry lot dairy corrals are recommended to supply this fast moving air.

4. Soaking and Misting. Water may be used to cool the air before it reaches the cow, such as in evaporative cooling pad systems, or cool-type systems in dry lots, or be used to enhance evaporative cooling of the cow 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.

Air Quality:

Protocols are in place to minimize airborne particles as a way to reduce odors, dust and noxious gases. The risk of infectivity 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. Other ways to improve air quality are with manure management, husbandry practices and good air movement provided by well-designed natural or mechanical ventilation systems. Adequate ventilation, be it natural or mechanical, helps to 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. Ventilation also modifies the indoor air temperature, but supplemental heating and cooling may be needed when temperature control is critical. Barns may 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 40-80 air changes per hour in the heat of the summer.

LYING AREA

Housing allow all classes of cattle to easily stand up, lie down, adopt normal resting postures, and have visual contact with other cattle, without risk of injury. Cattle have access to a bed that provides cushion, insulation, warmth, dryness and traction at all times when away from the milking facility.
During their life, dairy animals make use of a variety of resting, feeding and exercise areas. At all ages, in best practice, cattle are able to stand up, lie down and adopt normal resting postures within a given system. Factors that can affect these behaviors include the surface, size and configuration of the freestall or tie stall and the space provided to calves.

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 (Jensen et al., 2005; Munskgaard et al., 2005). It is therefore important to provide a bed that provides cushion, insulation, warmth, dryness, traction and minimizes the risk of injuries. Concrete, rubber mats, water beds and mattresses can only be acceptable resting surfaces when they are adequately bedded; the lack of adequate bedding reduces lying time and increased the risk of lameness and injuries (e.g. Haley et al., 2001; Rushen et al., 2007; Chapinal et al., 2013; Barrientos et al., 2014). Cattle have increased lying time in well-bedded environments, which also reduces the risk for lameness (Tucker and Weary, 2004; Cook et al., 2004). The most important predictor of hock injuries, for example, is the lying surface. 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 mattresses (Barrientos et al., 2014). In addition, appropriate bedding materials and manure removal help control mastitis. Bedding should be smoothed and groomed as often as is necessary to keep the surface clean, soft and dry (Drissler et al., 2005).

Bedding is also 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 (Fregonesi et al., 2007). 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 soft and dry bedding is also important for growing calves (Camiloti et al., 2012).

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 (Zubrigg et al., 2005; Tucker et al., 2004). 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. These features should not be overly restrictive and keep the stall clean by preventing cows from using the stall for lying and standing. In freestalls, the stall is often her only chance to stand on a soft surface. Less restrictive neck rails (further from the curb, higher) allow her to move fully into the stall and have been shown to reduce lameness. For instance, neck rail position that prevents four foot standing in the stall has been shown to increase lameness (Bernardi et al., 2009).

Exercise for tied animals provides opportunities for grooming the back of the body, social grooming and walking/trotting (Krohn et al 1994; Loberg et al 2004). Controlled studies show that exercise and pasture access may improve hoof health (Gustafson, 1993; Hernandez-Mendo et al., 2007). Comparisons across farms indicate that access to pasture reduces the risk of lameness (Chapinal et al., 2013) but other work shows that access to an outdoor area is a risk factor for some hoof health issues, including sole ulcers and digital dermatitis (Bielfeldt et al, 2005; Cramer et al 2009). These results indicate that the quality of
the exercise/outdoor area is important and, in best practice, minimizes any hoof damage. In best
practice, tied cattle have daily outdoor access/exercise (weather permitting) and the quality of the area
provided for this is clean, dry and of appropriate flooring material (see section on flooring later in this
chapter).

Space Allowance: In loose housing systems such as freestall barns, increased cow density in the pen
increases competition among cows for access to feed (Huzzey et al., 2006) and stalls (e.g. Fregonesi et
al., 2007) 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 (see Tables 2 and 3).
The implications of overstocking barns is 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 commercial 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 (Proudfoot et al., 2009). However, overstocking is associated with more lameness (Dippel et
al., 2009; Espejo and Endres, 2007), more hock injuries in some cases (Barrientos et al., 2013), and less
milk production (Bach et al., 2008) on commercial farms.

Proper open-lot systems begin with a design that ensures proper site drainage (Armstrong 2010).
Current recommendations suggest 600 ± 50 square feet of open-lot space per cow (Overton et al.,
2009), fence line to fence line. For bedded packs, suggested bedded space allowance is provided below
for heifers and mature cows in Tables 1 and 2.

### TABLE 1. ESTIMATED HEIFER BEDDED PACK SPACE REQUIREMENTS

<table>
<thead>
<tr>
<th>Space Requirement</th>
<th>Body Weight Estimate (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;130</td>
</tr>
<tr>
<td>Bedded resting area (Square feet/animal)</td>
<td>15</td>
</tr>
</tbody>
</table>

The Danish Agricultural Advisory Center. Translated into English and issued in 2002. Accessed from The
http://thedairylandinitiative.vetmed.wisc.edu/tdi/h_bedded_pack.htm

### TABLE 2. ESTIMATED ADULT COW BEDDED PACK SPACE REQUIREMENTS

<table>
<thead>
<tr>
<th>Space Requirement</th>
<th>Body Weight Estimate (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1100</td>
</tr>
<tr>
<td>Bedded resting area (Square feet/animal)</td>
<td>46</td>
</tr>
</tbody>
</table>

The Danish Agricultural Advisory Center. Translated into English and issued in 2002. Adapted and
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 Table 3 and 4.

TABLE 3. ESTIMATED HEIFER FREESTALL DIMENSIONS


TABLE 4. ESTIMATED ADULT COW FREESTALL DIMENSIONS
### Stall Dimension (inches)

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Units</th>
<th>1000</th>
<th>1200</th>
<th>1400</th>
<th>1600</th>
<th>1800</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total stall length facing a wall (A)</td>
<td>inches</td>
<td>96</td>
<td>108</td>
<td>108</td>
<td>120</td>
<td>120</td>
<td>126</td>
</tr>
<tr>
<td>Outside curb to outside curb distance for head-to-head platform</td>
<td>inches</td>
<td>192</td>
<td>204</td>
<td>204</td>
<td>216</td>
<td>216</td>
<td>216</td>
</tr>
<tr>
<td>Distance from rear curb to rear of brisket locator (B)</td>
<td>inches</td>
<td>64</td>
<td>66</td>
<td>68</td>
<td>70</td>
<td>72</td>
<td>75</td>
</tr>
<tr>
<td>Center-to-center stall divider placement (Stall width) (C)</td>
<td>inches</td>
<td>42</td>
<td>45</td>
<td>48</td>
<td>50</td>
<td>54</td>
<td>57</td>
</tr>
<tr>
<td>Height of brisket locator above top of curb (loose bedded stall) or mat/mattress surface (D)</td>
<td>inches</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Height of upper edge of bottom stall divider rail above top of curb (loose bedded stall) or mat/mattress surface (E)</td>
<td>inches</td>
<td>10</td>
<td>10</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>Height of neck rail above top of curb (loose bedded stall) or mat/mattress surface (F)</td>
<td>inches</td>
<td>42</td>
<td>45</td>
<td>48</td>
<td>50</td>
<td>54</td>
<td>57</td>
</tr>
<tr>
<td>Interior diameter of the stall divider loop (G)</td>
<td>inches</td>
<td>30</td>
<td>33</td>
<td>33</td>
<td>36</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td>Horizontal distance between rear edge of neck rail and rear edge of curb for mattress stalls (H)</td>
<td>inches</td>
<td>64</td>
<td>66</td>
<td>68</td>
<td>70</td>
<td>72</td>
<td>75</td>
</tr>
<tr>
<td>Horizontal distance between rear edge of neck rail and rear edge of curb for deep loose bedded stalls (H)</td>
<td>inches</td>
<td>58</td>
<td>60</td>
<td>62</td>
<td>64</td>
<td>66</td>
<td>69</td>
</tr>
</tbody>
</table>

*H 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.
Flooring:

The dairy farmer monitors and takes action to reduce the risk of slips and falls.

Under best practice, concrete flooring surfaces are appropriately grooved or textured to reduce the risk for animals slipping, which can result in injuries. 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 impact traction, such as ice (see Appendix L). It is essential that all maternity areas have high traction flooring given the increased number of standing bouts during labor (Huzzey et. al., 2005).
Cattle are herd animals. Socially isolated cattle show signs of stress: increased heart rate, vocalization, defecation/urination and cortisol levels (Herskin et al., 2007, Rushen et al., 1999). As a best practice, isolation is minimized and at least visual contact with other animals maintained. The only exception being when cow approach calving (see below).

Management of Facilities:

Properly designed and maintained facilities operated by trained animal caretakers greatly facilitate efficient movement of animals. In best practice, fences and gates are made of strong, smooth material and are devoid of sharp objects that can cut, puncture or bruise an animal. Their height and ground clearance prevent animals from trying to go over or under them. Fences hold animals in designated areas. Corrals, holding pens and feeding areas generally are permanently fenced, whereas temporary electric fences are often used around pastures. Gates let an animal easily pass through. It is beneficial to locate gates in the corners of pens. Install them to swing inward and outward so that the animals can easily enter or leave the pen. Under best practice, the latching mechanisms on gates are foolproof so that animals cannot open the gate. The latching mechanism on a stationary post does not create a sharp point when the gate is open, because this may injure passing animals.

SPECIFIC LIFECYCLE CONSIDERATIONS

Calving/Maternity Area:

A soft, cushioned, dry, well-lit, well-ventilated calving area is used.

A soft, cushioned, dry, well-lit, well-ventilated calving area has many health benefits for the calf at the time of birth. 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 separate calving area (maternity pen or paddock) 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 (Proudfoot et. al., 2014).

A best practice is to clean pens, corrals or paddocks between calvings. Recent work indicates that cows prefer to calve on sand and concrete flooring (covered with straw) compared to rubber flooring covered with straw (Campler et. al., 2014). Lighting should allow inspection of animals 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.

Pre-Weaned Calf Housing

Individual Housing: Each calf is housed in separate pens or hutches. While this method is perceived to minimize the risk of spread of disease (Kung et. al., 1997), avoid competition for feed, allow dry starter
intake of the individual to be monitored, and prevents cross suckling, there is limited evidence to support these claims (see review by Costa et al., in press). There is little scientific evidence of a consistent relationship between individual housing and calf health. Some studies (e.g. Webster et al., 1985; Gulliksen et al., 2009) have found more health problems in group-reared calves, but a growing number of empirical studies have found no advantage of individual housing in reducing morbidity when compared with small groups (e.g. Woltman-Toews et al., 1986; Perez et al., 1990, Johnson et al., 2011). Disease transmission is complex and many other farm management practices, in addition to grouping, influence the incidence of these diseases, such as method of milk-feeding, hygiene, ventilation, colostrum practices, diet and health monitoring. There is also now a growing body of evidence showing that individual housed calves exhibit cognitive deficits compared to socially housed (e.g. pair housing) calves (Meagher et al., 2015; Gallard et al., 2013).

**Group Housing:** There is a growing interest in group housing, particularly with the advances made in computerized calf-feeding equipment. Group housing allows for social interactions. Calves are social animals that need exercise and keeping dairy calves in groups may provide a number of advantages to both dairy farmers and their calves. Successful adoption of group housing will mean avoiding problems such as increased disease and competition for access to food resources. Successful group rearing requires appropriate management, including feeding method and group size. Adherence to appropriate cleaning of milk feeding equipment is essential (see Chapter 3: Management – Standard Operating Procedures).

**New Animals:** New animals are to be handled in a way agreed upon by the dairy farmer and veterinarian that is consistent with the biosecurity needs of the farm.

**Breeding Bulls:** Breeding dairy bulls are known to be aggressive towards humans. As a best practice, workers are trained in safety issues when breeding bulls are housed with the milking herd. In consultation with the veterinarian, bulls are managed in such a way that they have appropriate rest when rotating through breeding pens. Breeding bulls are included in the herd health plan to deal with any health issues that may arise such as lameness, body condition and infectious disease.

**REFERENCES**


  behaviour, use of shade and body temperature in a pasture-based system. Appl. Anim. Behav.

RESOURCES
- Effect of Flooring and/or Flooring Surfaces on Lameness Disorders in Dairy Cattle. (Shearer and
- Guide for the Care and Use of Agricultural Animals in Agricultural Research and Teaching.
  (Federation of Animal Science Societies, 2010) Online at
Chapter 8: Handling, Movement & Transportation

Under best practice, cattle are handled in a calm, controlled and gentle manner. Animal caretakers are properly trained in animal handling and the consequences of inhumane handling are understood and enforced. Animal caretakers are assessed and retrained on an annual basis. Prods, canes and other cattle handling aids are only used as a last resort, in emergency situations and not in routine animal handling. Cattle are moved in a manner that minimizes the risk of slips and falls.

STOCKMANKSHIP

Documentation exists of training for all new and existing employees with animal care responsibilities in stockmanship (including understanding of flight zones and flight distances, how to control animal movement in lanes, alleyways and other parts of dairy complex) and their assigned animal care responsibilities (such as calf care, euthanasia, non-ambulatory cow management, etc.) at least on an annual basis, or as needed.

[See Appendix F and Chapter 3]

All employees with animal care responsibilities sign a Cow Care Agreement at least once every three years. (For definition of Cow Care Agreement see Chapter 1)

When handling and transporting dairy animals, the animals’ comfort and safety, as well as the animal caretaker’s safety, are the primary concerns. Dairy farmers ensure that animal caretakers are trained and qualified in proper handling techniques and in the appropriate use of restraint equipment. When using any handling device, abuse is not tolerated. In addition, dairy farmers ensure that an adequate number of animal caretakers are available to perform assigned tasks. Injuries may be prevented if facilities are properly designed, maintained and operated.

Animals are handled humanely at all times. Routine contact with humans from birth, including regular gentle handling, will reduce fear and flight distance, make observation and treatment easier, and enhance animal care. Cattle are moved at a slow walk, particularly if the weather is hot and humid, or if the flooring is slippery. Injuries can be prevented if facilities are properly designed and maintained. It is particularly important to control the herd’s speed in lanes and alleyways to prevent crowding or crushing at corners, gates and other narrow places in a facility (Grandin, 2000).

In addition to these guidelines, the tail must never be used to move or restrain a cow. Willful mistreatment of cattle is unacceptable. The FARM Program does not tolerate abusive behavior. Observation of any abusive behaviors during Second-Party Evaluation will trigger the FARM Program Willful Mistreatment Protocol (see Appendix XX)

Noise: Loud noises are known to be aversive for cattle and thus 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 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.

EQUIPMENT

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 are appropriate for handling animals that refuse to move through facilities, but only if minimal force is applied. Any force used must be applied calmly. Excessive or routine slapping or prodding...
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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.
Aggressive behaviors in dairy cattle can be modified and their impact reduced by using acceptable practices and
restraint devices (e.g., palpation rails, head chutes, nose leads, squeeze chutes and stanchions). All equipment
used to restrain cattle and all cattle housing areas 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 (Palmer,
2002).

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, three measures are 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 (Grandin, 2000). Excessive use of electric prods is unacceptable (See Appendix XX).

Animal caretakers observe proper loading densities and plan to load or unload animals at the time of day that is
best for moving the animals. Animals grouped together for the first time are not to be crowded. In best practice,
sufficient labor and appropriate equipment are available for loading or unloading animals. Sick or injured animals
require special handling. In best practice, marketing decisions are made in a timely manner such that the animals
are fit for transport. Non-ambulatory animals or animals that are so weak or debilitated that they are likely to go
down during transit are treated or euthanized on-farm.

TRANSPORTATION FACTORS

The dairy has written protocols for culling and transporting dairy animals.

Transportation factors related to animal care include: facilities that are safe and comfortable to the animal, in-
transit care provided by knowledgeable crews and drivers, uniformity of the animals loaded and duration of the
trip. The Master Cattle Transporter Guide provides an extensive educational program on all aspects for
transporting cattle.

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 type of safety and comfort features of other facilities. 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 adequate for the weather conditions, (5) proper bedding (to protect animals
from weather extremes), and (6) 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. Chances for injuries are reduced when animals on a truck are
confined in several smaller groups. Weak or unhealthy animals are only shipped to a veterinarian and segregated
from healthy ones during loading and during transit; care is provided for their special needs (see Chapter 9:
Special-Needs Animals).

An adequate amount of time for the trip is allotted to include periodic checking of the condition of the animals.
Drivers start and stop the vehicle smoothly and slow down for curves and corners. If an animal falls in transit, it is
helped to its feet, provided that 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 are made immediately and provisions for feed are made if the
trip takes more than 24 hours. Follow any state regulations regarding frequency and amounts. 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 (see section on stockmanship above).

NEWBORN AND MILK-FED DAIRY CALF HANDLING

Animal caretakers are trained to handle and restrain calves with a minimum of stress to the animal.

Calves are moved by lifting, walking or using clean, properly designed mechanical transport devices.

Calves are handled in a calm, controlled and gentle manner. Animal caretakers are properly trained in animal
handling, and the consequences of inhumane handling are known and enforced, as discussed above in the section
on stockmanship. Calves are moved from the dairy onto the truck or in the auction market by walking or lifting
them. Calves can be injured if they are dragged, pulled or caught by the neck, ears, limbs, tail or any other
extremities, or if they are thrown. The FARM Program does not tolerate abusive behavior of animals of any age.
Observation of any abusive behaviors during a Second-Party Evaluation will trigger the FARM Program Willful
Mistreatment Protocol (see Appendix XX).

SPECIFIC LIFECYCLE CONSIDERATIONS

Transition Cows: To avoid the possibility of calves being born in marketing channels, cows near expected calving
date are not shipped. In the event a late gestation cow needs to be transported for reasons other than marketing,
special considerations are made. Milking Cows Under best practice: lactating cows are milked just before
transportation.

Sidebar Content: Guidelines for the Responsible Use of Electric Prods (Brandon Treichler)

The hotshot is a tool that when used properly, in the hands of a responsible operator, can help save a cow from
becoming a downer or being further injured. It is also a tool that can easily be misused by an untrained or
irresponsible user to cause harm. If your dairy elects to utilize hotshots, we recommend the following guidelines.
Hot Shots should NEVER be used on down cows that are in obvious pain or that are suffering. These cows should
be euthanized immediately.

- The use of hotshots be restricted to authorized managers that are trained on these guidelines
  - Dairy personnel that are in a situation that they think requires a hotspot must contact that
    manager to make them aware of the need and ask for their help.
  - We recommend that persons not employed and trained by the dairy, such as cattle haulers and
    hoof trimmers, NEVER be allowed to use hotshots on your facility. If situations arise where they
    need hotshots, a manager must be contacted first.
- The hotshot(s) should be kept in a secure locked location between uses and never be stored in common
  areas
- The managers locked farm vehicle or locked desk drawer are good options
- Before using the hot shot, the manager must assess the situation to determine:
  - That the cow can physically get up where she is and is not injured
  - That trying to rise will not injure the cow
Every effort should be made to improve the cows chances of successfully rising before actually employing the hotshot

- Improve footing by removing manure and applying dry dirt or sand or lime
- Ensure that the cows feet/legs are positioned properly underneath her so she can lunge

- Cattle must never be shocked in sensitive areas including the head (eyes, nose, ears, mouths), udder, vulva and anus
- Use of the hotshot should be restricted to the flank and thigh region of cattle
- Calves under three months of age should never be shocked

- Cattle can only be given a single “shock” that must not exceed 3 seconds duration
- If the cow does not rise after the single shock she must be treated as a down cow
- We recommend the dairy not utilize the McGrath style long electric prods and prefer the small hand held versions.
- There is a tendency to use the McGrath style hotshots as a stick and apply excess pressure with them
- The use of the McGrath style hotshot appears worse visually whether the shocking function is being applied or not

Responsible use of hotshots includes identifying areas and circumstances where the hotshot is used on the dairy and working to address the factors (cow and facility) that necessitate its use. The overall goal being the reduced need for the use of the hotshot.

REFERENCES


RESOURCES

- “Introduction to Dairy Stockmanship.” Dairy Care365TM Training Series. (Merck Animal Health, September 2012) To request a copy email: Info@DairyCare365.com
- “Moving Cows to the Milking Parlor.” Dairy Care365TM Training Series. (Merck Animal Health, February 2013) To request a copy email: Info@DairyCare365.com
- See It? Stop It! (Center for Food Integrity, 2013) Online at www.seeitstopit.org
- Merck Dairy Cares Videos on Non-Ambulatory and Stockmanship
- BQA resources on stockmanship
Chapter 9: Injured and Non-Ambulatory Animals

Even with the best care and adherence to the Herd Health Plan, animals can become ill, require medical treatment or euthanasia, or die. If an animal becomes sick, non-ambulatory or dies, it is critical to protect the other animals from potential diseases and to provide special care for the sick or recovering animal. A best practice on dairy farms includes being prepared to handle these conditions through proper employee training, segregation and prompt decision making to treat, market or euthanize an animal.

NUTRITION

Non-ambulatory animals have access to food and water at all times.

When an animal becomes sick or injured requiring separation from the herd for medical treatment (special-needs animal), the recovery of that animal is enhanced through appropriate nutrition. In best practice, a non-ambulatory animal has access to clean water (or milk or milk replacer in the case of a pre-weaned calf) and food at all times. The diet of a special-needs animal may need to be adjusted from its healthy counterparts based on its feed intake abilities and special considerations for its illness or injury. These animals are also protected from inclement weather in all seasons, including shade provision in summer.

ANIMAL HEALTH

The dairy has a written Herd Health Plan, developed in consultation with the licensed herd veterinarian (or veterinary consultant), which includes specific areas for non-ambulatory animal management:

- Proper movement, including use of special equipment.
- Husbandry and nursing care that provides shelter, water, feed, isolation from other animals and protection from predators.
- Prompt medical care.
- Euthanasia if warranted.

The dairy has a written Herd Health Plan, developed in consultation with the licensed herd veterinarian which includes specific protocols for euthanasia consistent with recommendations from the American Association of Bovine Practitioners and the American Veterinary Medical Association:

- Training of animal caretakers on the need for and recognition of animals to be euthanized.
- Designated animal caretakers trained in proper euthanasia technique(s).
- Confirmation of death.
- Record keeping of euthanized animals.
- Disposal of carcasses in compliance with local regulations.

Non-ambulatory cows are unable or unwilling to stand (Fenwick, 1969; Cox, 1988) and remain recumbent for ≥ 12 h (Burton et al., 2009; Stojkov et al., in press). Prompt decisions and actions are necessary if an animal becomes non-ambulatory. The dairy farmer or animal caretaker in charge must determine immediately whether the injured animal is otherwise healthy and can be nursed back to health or cannot be saved. If the non-ambulatory animal can be nursed back to health, protect it from further injury, provide it with shelter, food and water, and give it care to minimize its pain and discomfort during the recovery process. Euthanasia is appropriate when an animal’s quality of life is decreased or when pain and suffering cannot be alleviated. Personnel who routinely work with cattle need to be trained to recognize situations where euthanasia is the best option for the animal.
Designated animal caretakers are trained to perform euthanasia through a preferred technique consistent with recommendations from the American Association of Bovine Practitioners and the American Veterinary Medical Association (2013). If the animal appears to be experiencing severe pain or distress, can’t be saved or moved properly, has been chronically ill, or was recently treated with antibiotics requiring an extended withholding period, it should be euthanized by a person appropriately trained in the procedure. Dead animals, either euthanized or expired from natural causes, are potential sources of infection. They are promptly disposed of by a commercial rendering service or other appropriate means (e.g., burial, composting or incineration) in accordance with applicable ordinances. In best practice, dead animals are moved quickly to a designated location away from healthy animals and away from public view. Various state biohazard laws now regulate the disposal of infectious wastes. A postmortem examination on well-preserved animals can provide important animal health information and prevent further losses to the herd. 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.

**SIDEBAR CONTENT:**

**When is euthanasia appropriate?**

Actions involving compromised cattle include treatment, slaughter or euthanasia. The following criteria should be considered when making a decision: 1. Pain and distress of animal 2. Likelihood of recovery 3. Ability to get to feed and water 4. Drug withdrawal time 5. Economic considerations 6. Condemnation potential 7. Diagnostic information

**ENVIRONMENT AND FACILITIES**

Facilities are provided to segregate sick or injured animals; these facilities provide protection from heat and cold. Tools include the use of shade, fans, water cooling and windbreaks.

Self-locking stalls provide an emergency release for a non-ambulatory situation.

A hospital or sick pen that isolates the animal(s) from the herd is part of best practice. Because 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. It provides adequate shade, bedding, air movement and accessibility to feed and water.

**HANDLING, MOVEMENT AND TRANSPORTATION**

Timely and prompt marketing of animals is part of the management plan.

Designated animal caretakers have been trained and proper equipment is available to move non-ambulatory animals. Special equipment for injured or non-ambulatory animals is available.

Trained animal caretakers are available when sick, injured, non-ambulatory or dead animals must be moved.

Non-ambulatory cattle that cannot be carried are moved with an appropriate sled, sling or bucket, with the exception of cases where an animal must absolutely be moved a short distance before an appropriate movement aid can be used (e.g. if a cow becomes non-ambulatory in a parlor). Cattle are not pulled, dragged or otherwise moved through mechanical force applied directly to the animal. In best practice, the prognosis of an animal is 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, the animal is euthanized and then moved (in accordance with the Herd Health Plan). Prevention, preparation, and prompt action are keys to their proper handling. Weak and emaciated animals often become non-ambulatory. Conditions that increase an animal’s susceptibility to injury – slippery floors,
improperly designed loading ramps and excessive loading densities on trucks – are minimized in best practice. A commitment to prevent animal injuries includes shipping promptly.

Clearly defined policies requiring appropriate handling practices are established and followed, and animal caretakers are trained and supervised in proper animal handling, especially during parturition. If moving a non-ambulatory animal becomes necessary, such movement requires the proper equipment and trained animal caretakers. An animal may become injured on the dairy or during transportation. Use an adequate number of people along with equipment and handling devices that are appropriate to the animal’s size. If these techniques are not practical, euthanasia is recommended. Euthanasia is strongly recommended if an animal goes down in the belly compartment of a semi-trailer that does not have side doors, because humane removal is nearly impossible.

RECOMMENDED PROCEDURES FOR MOVING A NON-AMBULATORY ANIMAL:

- Gently roll a non-ambulatory animal onto a large piece of plywood or conveyor belting. If belting is used, reinforce one side with smooth-edged metal strips to prevent it from buckling and bending when moving the animal. If the animal goes down in a pen or alley, tow it on the plywood or belting with a truck or tractor to a transfer point. To offload a non-ambulatory animal from the center compartment of a semi-trailer equipped with side doors or from a low stock trailer, drag the belting with the animal on it to a transfer point.
- Carefully transfer the animal to a properly equipped forklift or to the bucket of a large loader, or move the animal with a special lifting harness.
- If a forklift is used, 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, and equip the pallet with straps to prevent the animal from falling off. Never use exposed forks.
- Specialized hoists can fit into tight spaces and are built to gently lift and lower a non-ambulatory animal.
- When using the bucket of a large loader, a best practice is to have at least three people available to transfer the animal into the bucket. One person runs the loader, and the other two roll the animal onto the bucket.
- Do not drag or lift an animal by its limbs unless there is no other alternative and only if the animal must be moved a few feet, such as in a milking parlor. If the animal must be dragged because no other moving alternative exists or because it can be saved only by dragging, 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.
- If a mature animal is discovered to be down, it may need to be moved. If the animal is down in a stanchion, tie stall or freestall, frequently the rear leg on the down side is cramped in an unnatural position. Often, moving an animal so the legs are properly positioned will allow the animal to stand on its own. If, following treatment, the animal is unable to rise, it is imperative that it be moved so that its legs can be extended. The only practical way to move such an animal is with a strong halter on the head or a padded chain around the neck. If a single rear limb is used to move the animal, further injury may be incurred.

SIDEBAR Content: Appropriate Use of Hip Lifts (Brandon Treichler)

Hip lifts or hip clamps, when used properly, can be a tool that can legitimately improve the prognosis of some down cows. Even with careful use, hip lifts will cause tissue damage (trauma) to the hips and surrounding pelvic structures. Because of this it is critical that all possible precautions are taken to minimize this damage, and that hip clamps are only used on cows whose overall prognosis can benefit from them and not for the convenience of the dairy.

- If a cow is in obvious pain or is suffering she MUST be euthanized immediately!
It is important to assess the likely cause of the cow being down and her prognosis for recovery before lifting with hip clamps.

- They are best used on cows that are bright and alert, and that are likely to stand once lifted and treated.
- Lifting is not acceptable for cows with injuries such as broken bones or dislocated hips.

- Hip Clamps must **NEVER** be used to relocate or move animals. Bundling the cow and rolling her onto a sled or into an appropriately sized loader bucket are the acceptable means for moving a down cow.
- When lifting a cow with hip clamps, the cow must never be lifted high enough for her feet to completely leave the ground.
- Hip clamps should be loosened and removed as soon as the cow is bearing weight.
  - Clamps must be removed immediately if the cow is not fully weight bearing after 5 minutes.
  - Clamps should not remain on **ANY** cow longer than 10 minutes.
- After being lifted, if the cow refuses to bear weight on the front legs, she should immediately be lowered and clamps removed. The prognosis for these cows should be downgraded to poor.
- Hip clamps should have fully padded loops with rubber or foam tubing to lessen the damage.
- Repeated lifting sequences increases the likelihood of significant damage to the cow. No cow should be lifted more than 3 times in a 24 hour period and cows that are down more than 24 hours should have their prognosis downgraded.
- In order to have the best chance of getting up, down cows should be rolled to the opposite leg hourly, if not rolling herself, to avoid nerve paralysis in the hind legs. They must have ready access to food, water and shade/shelter.

As with any disease, our goal as an industry should be to identify the risk factors and risk areas on your dairy that lead to down animals and manage those areas to avoid as many down cows as possible. Despite this, some cows will become down due to injury or disease. At the dairy level, and when used properly, hip lifts can be an effective part of managing down cow cases.

REFERENCES


RESOURCES

- Disposal Disabled Livestock Policy. (AVMA) Online at www.avma.org/KB/Policies/ Pages/Disabled-Livestock.aspx
Chapter 10: Dairy Beef

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 marketed dairy cows, bull calves and freemartin heifers during their time on the dairy farm and considerations for their marketing as beef animals. 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 is not marketed if there is a reasonable chance it will become non-ambulatory at any time from leaving the farm to the harvest facility. Animals in poor body condition have an increased likelihood of becoming non-ambulatory during transport to or at a processing facility. Dairy farmers must also take care to observe all treatment withdrawal times. Before a lactating marketed dairy animal is shipped, she is milked to reduce potential udder discomfort.

The following are some important initial considerations that should be followed to ensure a safe beef supply.

Treatment protocols that specify age class, product and route of administration to ensure food safety, including proper milk and meat residue withhold times as well as definitions of what cattle are eligible to be marketed.

The dairy has written protocols for culling and transporting dairy animals, developed in consultation with the herd veterinarian.

In best practice, such protocols should include the following considerations:

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 rehydrated.
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 where 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 for to receive veterinary treatment. When using any handling device, abuse is never tolerated (See FARM Willful Mistreatment Protocol, chapter 8).

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.

Transporters play a critical role in the health and welfare of the dairy cattle. The proper handling and transport of cattle can reduce sickness in calves, prevent bruises, and improve the quality of the meat from these animals. In best practices, animal transporters are trained in how to properly move cattle up to and on to the trailer, distribute cattle correctly on the trailer, hauling techniques that reduce cattle stress, and handling emergency situations. Additionally, all transporters should sign a cow care agreement indicating that they have received basic stockmanship training and agree to treat all animals humanely. Animal abuse is never tolerated.

SIDEBAR Content: Master Cattle Transporter

The dairy adheres to all withdrawal times for milk and meat. In the last three years, the dairy has not been subject to any residue violations.

The dairy maintains permanent records on all animals treated with drugs. Such records are easily accessible to everyone who works with the animals and show how all drugs were used and disposed.

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

1. **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, redness and swelling of the udder, to no visible change in the udder.

2. **Metritis** - USDA inspectors will look for this post-mortem indications. Be mindful of sending animals to slaughter that show signs of metritis.

3. **Peritonitis and surgery** – Signs of recent surgical procedures Findings of surgical devices (e.g., suture, toggles, fistula devices) are only significant if they are associated with active peritoneal or subcutaneous inflammation.
4. **Injection Sites** – Live animals and carcasses with lesions or abscesses associated with injections on any part of the animal are of potential concern.

5. **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. Animals exhibiting any of the following conditions: depression, an elevated or subnormal body temperature, hyperemic skin, congested mucous membranes, dehydration, or poor body condition, in association with an injury or inflammatory condition, such as abscesses, arthritis, pneumonia, mastitis, metritis, or diamond skin.

6. **Signs of Treatment** – Signs of treatment, as indicated by 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. These 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.

**DAIRY BULL CALVES AND FREEMARTIN HEIFERS**

Calves receive colostrum or colostrum replacer soon after birth, even if immediately transported off the farm.

Calves receive a volume and quality of milk or milk replacer to maintain health, growth and vigor until weaned or marketed.

Calves have access to palatable, clean, fresh water as necessary to maintain proper hydration.

In best practice, all calves, whether they are raised as a replacement heifer, veal or dairy steer, receive colostrum or colostrum replacer and are fed in a way that promotes health and reduces the risk of disease. Please refer to Chapter 4: Newborn and Milk-Fed Dairy Calves for additional information on newborn calf animal care practices.

**SIDEBAR Content:**

Recommendations for administration of vaccines and other injectable products:

1. Always follow label instructions for route of administration and dosage (needle size).
2. All injections should be given in front of the shoulder slope and in a subcutaneous manner if label permits.
3. Never straighten a bent needle and use again.

**RESOURCES**

- Beef Quality Assurance Program. Online at [www.bqa.org](http://www.bqa.org)
- Master Cattle Transporter Guide
- USDA Guidelines on Slaughter
Chapter 11: Third Party Verification

Confirmation by Third-Party Verifiers of the practices used by FARM Program participants demonstrates the integrity of the program’s animal care guidelines module and provides evidence to our stakeholders documenting the dairy industry’s commitment to ethical care and well-being of dairy animals. The objective of the FARM Program is to set guidelines for care of dairy animals and to provide statistically verified data demonstrating that proper animal care is an expectation in the dairy industry.

PROGRAM INTEGRITY THROUGH THIRD-PARTY VERIFICATION

As part of the National Dairy FARM Program, the evaluated farm will participate in the random statistical sampling Third-Party Verification program.

INFORMATIONAL: Your dairy has been selected and has undergone a FARM Program 3rd Party Verification.

Third-Party Verification is not to identify winners and losers in animal care, but to test the integrity of FARM Program animal care guidelines. In essence, when the dairy industry makes assertions about animal care based on participation in the FARM Program animal care on-farm evaluation, Third Party-Verification ensures those assertions are measurably true.

Through a statistical sampling, an appropriate number of dairy farms participating in the FARM Program are randomly selected for Third-Party Verification. The Third-Party Verification is administered at the randomly selected sites, and is not intended to imply preference for those operations or give them permission to use the verification as an advantage over other operations. The statistical sampling includes selection criteria such as geographic location, size and operation type to ensure that the small number of randomly selected dairy farms mirrors participants in the entire program.

The program uses an annual Third Party Verification process. The complete statistical sampling program and Third-Party Verification process are available on the FARM Program website. Third-Party Verification is conducted by someone who does not have a conflicting interest in the operation or the outcome of the verification process. From a pool of certified and trained qualified Third-Party Verifiers, the FARM Program has retained the services of an ISO-certified Third-Party Verification company. Verification by outside parties helps ensure that the program accomplishes its goals and objectives, and provides customers and consumers with a statistically valid demonstration that dairy farmers are meeting their ethical obligation for on-farm animal care. A Third-Party Verifier conducts an on-farm examination of each dairy farm that is randomly selected in the verification process.

There are only two ways to be automatically removed from the FARM Program: (1) refusal to participate in Third Party Verification, or (2) if willful mistreatment of animals is observed at any time. The FARM Program animal care module is a collective program for all participants, so an individual dairy farm that is randomly selected for Third-Party Verification will not be responsible for the cost of the on-farm verification process. Details of the Third-Party Verification process are available on the FARM Program website.
OTHER VERIFICATION OPTIONS

An individual dairy farmer, cooperative or proprietary processor may choose to have Third-Party Verification conducted on their farm(s) outside of the statistical sampling that occurs among all FARM Program participants. A dairy farmer, cooperative or proprietary processor who chooses additional Third-party Verification will be responsible for associated costs. A cooperative or proprietary processor may use statistical sampling or conduct Third-Party Verification on all of its dairy farmers. In any of these cases, Third-Party-Verification should be conducted by someone who does not have a conflicting interest in the operation or the outcome of the verification process. Third-Party Verification services should be obtained from a pool of certified and trained or otherwise proven qualified Third-Party Verifiers. The FARM Program can assist in identifying Third-Party Verification service providers.