NORTHWEST SUSTAINABLE DAIRIES

ANIMAL CARE AND WELFARE

INTRODUCTION

There are growing concerns about the welfare of agricultural animals. As legislation aimed at regulating farm animal welfare is increasingly proposed and passed it has become imperative for members of the animal industries to self-regulate, keeping in mind scientific findings as well as social concerns of stakeholders. A growing number of questions are being raised about standard industry practices and their impacts on farm animal well-being.

In recognition of these concerns, the leadership of the Northwest dairy industry has worked in partnership with stakeholders and participating farmers to outline professional expectations for participants detailing our obligation to the animals in our care.

Proper animal care is essential and necessary to ensure healthy dairy animals. Through appropriate *housing, nutrition*, *animal health*, *handling*, *movement, and transport* as well as *worker education,* animal care and welfare can be optimized for dairy cattle.

This document outlines these expectations and responsibilities in greater detail.

The format and content of this Animal Care and Welfare section was adapted from the National Dairy Animal Well-Being Initiative.

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HOUSING

Guiding Principle: Facilities should be designed, constructed, and maintained to provide and promote health, comfort, and safety of all animals.

> A clean, safe, and comfortable environment is important for the health and the well-being of dairy cattle.
>
> Housing should be maintained to ensure a healthy, supportive environment is available for all animals.

Expectation for Newborn Calves: Calves should be born in a clean environment. The calving area should be separate from the rest the herd.

Background: Calving in a clean environment benefits both calf and cow health. Providing a clean calving environment minimizes the exposure of the calf to harmful bacteria and other risks. For the cow, a clean environment helps her to recover after calving. Having the calving area separate from the rest of the herd allows for closer observation, provision of assistance, if necessary, and avoidance of injury to the animals and caretakers.

Verification: Visual inspection of calving area (pens and/or pasture). Determine frequency of calf mortalities.

Expectation for Heifers: Heifers should be provided with a clean, comfortable, and safe environment. Heifers should also be provided with shelter that is appropriate for weather and climatic conditions. If housed individually, heifers must have sufficient area to lie down and allow for normal resting behavior. In circumstances where heifers are group housed, sufficient space should be allocated to ensure that, at all times, each animal can lie comfortably without competing for space. Whenever possible, heifers should have the freedom to move around and express normal behavior. To minimize the incidence of injury, flooring should be designed and maintained to avoid excessive slips and falls. All animal housing should have adequate ventilation for animal and worker health.

Background: Providing clean, comfortable, and safe shelter with good air quality minimizes animal distress and promotes good health. Inadequate air ventilation can lead to health problems and should be avoided.

Note: Information on ventilation in dairy housing facilities can be obtained from your local extension office, or refer to articles in the NRAES-77 publication (see references).

Verification: Visual assessment of animals and facility. Hygiene scoring of animals.

Expectation for Cows: Cows should be provided with a clean, comfortable, and safe environment. Cows should also be provided with shelter that is appropriate for weather and climatic conditions. If housed individually, cows must have sufficient area to lie down and allow for normal resting behavior. In circumstances where cows are group housed, sufficient space should be allocated to ensure that, at all times, each animal can lie comfortably without competing for space or lying on and/or against one another. Whenever possible, cows should have the freedom to move around and express normal behavior. To minimize the incidence of injury, flooring should be designed and maintained to avoid excessive slips and falls. All animal housing should have adequate ventilation for animal and worker health.

Background: Housing dairy cows in a clean environment promotes proper animal hygiene, which can positively affect udder health. Providing appropriate shelter at all times further ensures animal comfort and health. Maintaining good air quality promotes animal comfort and helps prevent disease.

Verification: Visual assessment of animals and facility. Locomotion evaluation. Hygiene scoring of animals.

Expectation for Bulls: Bulls should be provided with a clean, comfortable, and safe environment. Bulls should also be provided with shelter that is appropriate for weather and climatic conditions. If housed individually, bulls must have sufficient area to lie down and allow for normal resting behavior. In circumstances where bulls are group housed, sufficient space should be allocated to ensure that, at all times, each animal can lie comfortably without competing for space or lying on and/or against one another. Whenever possible, bulls should have the freedom to move around and express normal behavior. To minimize the incidence of injury, flooring should be designed to avoid excessive slips and falls. All animal housing should have adequate ventilation to ensure proper air quality is maintained for animal and worker health.

Background: Bulls should be housed in a clean, comfortable, and safe environment to promote animal health and well-being. Maintaining good air quality promotes animal comfort and helps prevent disease.

Verification: Visual assessment of animals and facility. Locomotion evaluation. Hygiene scoring of animals.

NUTRITION

Guiding Principle: All animals should have access to a nutritionally adequate diet and clean, fresh water daily.

Expectation for Newborn Calves: Every newborn calf must receive adequate quantities of high quality colostrum as soon as possible after birth. The colostrum should be fed in a way that promotes health and minimizes the risk of disease. This applies to bull calves as well as heifer calves.

Background: Dairy calves are born without natural immunity. Initial immunity of the calf is acquired by consuming colostrum. Colostrum, the first milk produced after calving, contains immunoglobulins which provide the calf with immune protection. Colostrum is a better source of immunoglobulins, protein, fat, minerals and vitamins than the milk produced during any other stage of lactation. The concentration of these immunoglobulins and nutrients decreases with subsequent milkings. The calf has the ability to absorb the immunoglobulins directly from the digestive tract into the blood, but this ability decreases rapidly within the first 24 hours after birth.

Proper nutrition is essential for promoting and maintaining animal health and well-being.

Dairy cattle must have access to a wholesome, balanced diet that is formulated to meet the animal's nutritional needs to ensure a healthy life.

Guideline: According to the "Guide for the Care and Use of Agricultural Animals in Agricultural Research and Teaching" all calves should consume colostrum in the amounts of 8 to 10% of body weight (2 to 3 quarts) within 4 to 5 hours after birth. This same amount of colostrum should also be fed to the calf a second time within 24 hours of birth.

Verification: Review written farm protocol and any verifiable records. Talk with manager and employee(s) responsible for calf care separately. If frozen colostrum or colostrum replacement is used, look for those items. Identify appropriate source of colostrum. Determine frequency of calf illness or mortality.

Expectation for Heifers: Heifers must have access to a wholesome, balanced diet and clean water. Feed should be fed in a manner that promotes health and minimizes risk of disease. Adequate bunk space should be provided so all animals can access feed without undue competition.

Background: A balanced diet is necessary for heifers to reach full genetic potential at maturity. For this to occur, the diet should meet the National Research Council's Nutrient Requirements of Dairy Cattle (2001) published recommendations for heifers. Dietary adjustments may be necessary to accommodate the changing nutritional requirements of heifers.

Verification: Visual inspection of heifer feeders, feed on hand, and condition of waterers. Talk with manager and employee(s) responsible for heifer care separately. Evaluate body condition scores. Determine if there is a relationship with a nutritionist and if nutrient analysis is available for feed ingredients.

Note: Body condition scoring is 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 a score of 1 for extremely thin animals and a score of 5 for extremely fat animals. Ideal body condition scores vary, depending on the stage of development or lactation (Wildman et al., 1982). Breed specific height and weight goals for dairy heifers can be found in "Monitoring Dairy Heifer Growth" by Jud Heinrichs and Brian Lammers.

Note: Information about adequate bunk space and other feeding behavioral issues is found in "Understanding Cow Behavior from a Nutritional Perspective", which can be found online at: tristatedairy.osu.edu/Proceedings%202008/DeVries%20paper.pdf.

Expectation for Cows: Cows must have access to a wholesome, balanced diet and clean water. Feed should be fed in a manner that promotes health and minimizes risk of disease. Adequate bunk space should be provided so all animals can access feed without undue competition.

Background: Adult cows need adequate feed and water to meet genetic potential and maintain a productive, healthy life. Diets should meet the needs of cows as outlined by the National Research Council's Nutrient Requirements of Dairy Cattle (2001) published recommendations. Dietary adjustments may be necessary to accommodate the changing nutritional requirements of cows. For example, the nutrient requirements for a dry cow are different than those for a lactating cow.

Verification: Visual inspection of feeders, feed on hand, and condition of waterers. Talk with manager and employee(s) responsible for cow care separately. Evaluate body condition scores. Determine if there is a relationship with a nutritionist and if nutrient analysis is available for feed ingredients.

Guideline: According to Temple Grandin (2007), at least 90% of the cows on a dairy farm must have a body condition score of more than 2. Fewer than 3% should have a score of less than 2.

Expectation for Bulls: Dairy bulls must have access to a wholesome diet and clean water. Feed should be fed in a manner that promotes health and minimizes risk of disease. Adequate bunk space should be provided so all animals can access feed without undue competition.

Background: Dairy bulls need adequate feed and water to reach full genetic potential at maturity and maintain a productive, healthy life. Diets should meet the needs of bulls as outlined by the National Research Council's Nutrient Requirements of Dairy Cattle (2001) published recommendations. Dietary adjustments may be necessary to accommodate a bull's nutritional requirements.

Verification: Visual inspection of bull feeders, feed on hand, and condition of waterers. Talk with manager and employee(s) responsible for bull care separately. Evaluate body condition scores. Determine if there is a relationship with a nutritionist and if nutrient analysis is available for feed ingredients.

ANIMAL HEALTH

Guiding Principle: The health of all animals should be maintained through preventive care programs, supported by rapid diagnosis and proper treatment when necessary.

A. VETERINARY - CLIENT RELATIONSHIP

Expectation: All dairy farms should have a valid relationship with a veterinarian.

Background: A veterinary-client relationship is the interaction between the client, the animals, and the veterinarian. This interaction should occur on a regular basis and should encompass various aspects of herd health management for the relationship to be considered valid.

Guideline: According to the American Veterinary Medical Association (2008), a valid veterinary-client relationship exists when all of the following conditions have been met:

1) The veterinarian has assumed responsibility for making clinical judgments regarding the health of the animal(s) and the need for medical treatment, and the client has agreed to follow the veterinarian's instructions.

2) The veterinarian has sufficient knowledge of the animal(s) to initiate at least a general or preliminary diagnosis of the medical condition of the animal(s). This means that the veterinarian has recently seen and is personally acquainted with the keeping and care of the animal(s) by virtue of an examination of the animal(s), or by medically appropriate and timely visits to the premises where the animal(s) are kept.

3) The veterinarian is readily available, or has arranged for emergency coverage, for follow-up evaluation in the event of adverse reactions or the failure of the treatment regimen.

Verification: Review medication prescriptions and receipts from a veterinarian.

Animal health is an indicator of appropriate animal husbandry, as well as food safety practices.

Preventive care and proper management should be used to promote and maintain animal health. Rapid diagnosis and treatment should be administered immediately to all ill and/or injured animals.

B. HERD HEALTH PLAN

Expectation: All dairy farms should have a written, current herd health plan which addresses all important aspects of herd health. The herd health plan should be developed, documented and regularly updated with a veterinarian. At minimum, the herd health plan should include the following elements:

I. Newborn Calf Health and Care
II. Disease Prevention and Management, including routine vaccinations
III. Hoof Health
IV. Udder Heath
V. Non-ambulatory Animal Handling
VI. Biosecurity
VII. Animal Mortality Management, including proper euthanasia procedures
VIII. Emergency Contact Information

Background: The health of the animals on a dairy farm is an essential part of proper animal husbandry. Prevention, rapid diagnosis, and treatment of injury or disease provide the foundations for good animal well-being. The development of a herd health plan assists with the prevention of common diseases and establishes treatment protocols when medical attention is necessary.

Verification: Review herd health plan and observe date of last revision.

C. MEDICATION USE

Expectation: All medications administered for treatment of animals should be used in a responsible manner.

Background: Medications are used for reducing animal pain and discomfort, as well as curing ailments. Proper treatment of ill animals includes prompt diagnosis and a plan which may require the use of medications. However, medications should only be used when they are absolutely necessary and should be administered with the appropriate dose and route of administration. Prudent use of antibiotics minimizes the risk of developing antibiotic resistance, minimizes other adverse environmental impacts, and reduces the opportunity for antibiotic residues to appear in food products. Any medications given to an animal must be administered in accordance with a veterinarian's recommendations.

Verification: Review medication prescriptions, herd health plan, and records documenting treatments.

D. MANAGEMENT PROTOCOLS FOR PAINFUL PROCEDURES AND CONDITIONS

Expectation: All dairy farms should have management protocols for painful procedures and conditions. Animal distress and disruption of normal behavior should be managed and minimized.

Background: Certain elective procedures performed to facilitate management of dairy animals may cause short term distress, discomfort, and/or pain.

I. TAIL DOCKING

Expectation: Tail docking is discouraged. If a dairy farm chooses to dock tails, then tails should be docked at a time and in a manner that will cause animals the least amount of pain, distress, and disruption of normal behavior. Veterinary counsel is advised.

Background: Tail docking is not a common practice on Northwest dairy farms. However, most dairy farms that milk cows with docked tails report improved employee and cow cleanliness.

Note: In terms of udder health, udder cleanliness, or cow cleanliness, most studies have shown no difference between cows with intact tails and those with docked tails (Tucker et al., 2001; Schreiner and Ruegg, 2002). One study showed that the rear quarters of the udder were cleaner for cows with docked tails when compared with intact cows; however, udder cleanliness scores and udder health measures were not different (Eicher et al., 2001). While studies have shown mild to moderate behavior changes and acute pain as a result of the tail docking procedure (Eicher and Dailey, 2002; Eicher et al., 2006) and increased fly load with docked tails (Eicher et al., 2001, Eicher and Dailey, 2002; Tom et al., 2002), there is inconclusive evidence whether or not animals experience chronic pain from tail docking (Tom et al., 2002) and some studies found little to no behavioral or physiological differences (Eicher et al., 2000; Eicher et al., 2001; Schreiner and Ruegg, 2002). Switch trimming or clipping, rather than tail docking, can be practical for animal cleanliness, improved employee comfort and health, excellent udder hygiene and milk quality (Tucker and Weary, 2001), and is recommended as an alternative to docking tails.

The American Veterinary Medical Association opposes routine tail docking of cattle and states that, when medically necessary, tail docking must be performed by a licensed veterinarian. Docking in an appropriate location on the tail is recommended to ease the docking process and to avoid leaving a tail that is too short for proper restraint or normal protection of the urogenital tract (Stull et al., 2002).

Verification: Visual determination if tails are docked. If tails are docked, assess the resulting tail length and at what age the procedure occurs. Review tail docking protocol.

II. DEHORNING

Expectation: Calves should be dehorned at the earliest age possible. Dehorning should be performed in a manner that causes the animal the least amount of pain, distress, and disruption of normal behavior. If calves are older than three months, a local anesthetic should be administered prior to dehorning. The dehorned area should be protected and treated when appropriate. Veterinary advice may be necessary.

Background: Dehorning is performed to reduce the risk of cattle injuring herdmates and personnel, reduce feeder space requirements, and increase handling ease. Calves should be dehorned at the earliest age practicable to ease restraint and handling, reduce the risk of major blood loss, and minimize the chance of infection and/or fly larvae infestation. Ideally, dehorning should be performed on calves before three months of age (Agriculture Canada, 1990; La Fontaine and de Witte, 2002). If calves are older than three months, a local anesthetic should be administered prior to dehorning to minimize pain and discomfort.

Verification: Visual assessment of calves. If dehorning occurs after three months of age, review receipts for the procedure. Talk with manager and employee(s) responsible for dehorning separately.

III. CASTRATION

Expectation: Castration of bulls should be performed at the earliest age practicable to minimize pain, distress, and disruption of normal behavior. If the bull to be castrated is older than four months of age, then the operation should be performed with veterinarian assistance and using a local anesthetic. Follow-up care should be provided if necessary.

Background: Bull calves are castrated to reduce the chance of unplanned mating, as well as to reduce aggression toward other animals and animal caretakers. Bull calves should be castrated at the earliest age practical. If bulls are older than four months of age, then a local anesthetic should be used for the procedure to minimize pain and discomfort.

Verification: Visual assessment of bull calves and steers. If castration occurs after four months of age, review receipts for the procedure. Talk with manager and employee(s) responsible for castration separately.

E. SPECIAL NEEDS ANIMALS

Expectation: All dairy farms should have protocols for humane handling of special needs animals, which includes sick, lame, and downer cows.

Background: On occasion, dairy farms may have special needs animals that must receive special handling and treatment. It is critical that these animals are protected from other animals, are provided appropriate shelter, and have easy access to food and water. While special needs animals receive treatment, it is also important to manage pain and minimize animal discomfort. Euthanasia may be appropriate for chronically ill animals or injured animals experiencing severe pain or distress that cannot be relieved.

Verification: Review written protocol for handling special needs animals. Talk to those involved in the handling of special needs animals. Visual assessment of sick pens. Review treatment records.

F. EUTHANASIA

Expectation: All dairy farms should have a written protocol for the timely and humane euthanasia of dairy cattle. Any individual responsible for euthanasia must be trained and competent in the methods selected for use.

Background: Euthanasia may be necessary for animals with a terminal prognosis that are unfit for harvest or transport. Euthanasia should be performed in a manner consistent with the standards set by the American Association of Bovine Practitioners.

Guideline: The following methods of euthanasia are acceptable:

**Gunshot*
**Penetrating captive bolt*
**Barbiturate overdose*
**Electrocution*
**Exsanguination preceded by any of the above.*

Euthanasia by blunt force trauma, such as a hammer blow, exsanguination without stunning, injection of air or chemicals that would cause a painful death, or electrocution with wall current are not acceptable methods.

More information about Euthanasia can be found in "Practical Euthanasia of Cattle: Considerations for the Producer, Livestock Market Operator, Livestock Transporter, and Veterinarian" prepared by the Animal Welfare Committee of the American Association of Bovine Practitioners. Available online at: aabp.org/resources/euth.pdf.

Verification: Review written protocol for euthanasia. Talk with individual(s) responsible for performing euthanasia. Review treatment and euthanasia records.

HANDLING, MOVEMENT, AND TRANSPORT

Guiding Principle: Handling, movement, and transport of animals should be done in a humane, appropriate and safe manner.

> Proper animal handling, movement, and transport are important for maintaining animal health.
>
> Dairy cattle should be handled in a manner that promotes safety and well-being for both the animal and the animal handler.

Expectation: All dairy farms must take care to handle animals in a calm, gentle, and appropriate manner.

Background: Animals must be handled calmly and appropriately at all times to avoid unnecessary pain or distress. Proper training and retraining of employees is essential for maintaining a farm that handles animals appropriately. Individuals handling the animals must be trained in animal handling, and the consequences of inhumane handling should be known and enforced. Handlers should be assessed and retrained as needed, on a regular basis. The use of electric prods is prohibited except as a last resort when animal and human safety is in jeopardy.

Guideline: Animals should be moved in a manner that results in fewer than 1% of animals falling as they go to or from the milking parlor (Grandin, 2007).

Verification: Review protocol for handling animals. Visual assessment of caretakers moving animals. Review documentation of training completed by employees for handling animals and parlor behavior.

Expectation: Animals that are unable to stand and/or walk unassisted should receive extra care when being handled or moved to avoid unnecessary pain or distress to the animal.

Background: Although generally not common on farms, animals can become non-ambulatory for a variety of reasons ranging from acute injury (a broken leg or nerve damage from calving) to attenuating illness or severe lameness. When an animal becomes non-ambulatory, the potential for recovery must be assessed. Animals that are likely to recover should be moved to an area with adequate bedding, access to feed and water, and no risk of trampling by other animals. They should also have appropriate shelter from direct sunlight or inclement weather. Non-ambulatory animals that cannot be carried should be moved with an appropriate sled or sling. Animals should not be pulled, dragged, pushed, or otherwise moved using force applied directly to the animal. A prognosis should be considered before the decision is made to move the animal. Farms should have a plan for dealing with non-ambulatory animals in the herd health plan.

Guideline: Methods for moving downer animals include:

**Use of a wide conveyer belt is one way to move downer animals. A three-foot-wide conveyer belt can often be obtained from mines inexpensively. The animal can be rolled onto the belt, and the belt can then be moved with a tractor.*

**Harnesses are available for lifting downer animals. The use of a harness requires ceiling space for a forklift or a lifting loader.*

**If a larger loader is available, an animal can be rolled into the bucket, although this method is not preferable in most circumstances.*

**Double-deck semi-trailers that regularly haul old dairy cows should have a side door in the belly compartment so downer animals can be rolled out the door instead of being dragged up the rear ramp. If an animal goes down in the belly compartment of a semi-trailer without side doors, humane removal is impossible; euthanasia is strongly recommended.*

More information about handling downer animals can be found in "Handling of Crippled and Nonambulatory Livestock" published Fall 1998 in the Animal Welfare Information Center Bulletin, Vol. 9, no.1-2 by Temple Grandin, Ph.D. Available online at: nal.usda.gov/awic/newsletters/v9n1/9n1grand.htm.

Verification: View the equipment used for moving non-ambulatory animals. Talk with manager and employee(s) responsible for this duty separately. Observe on-site handling practices. Review documentation of training. Review herd health plan.

Expectation: Handling and loading facilities must be safe for all animals. Caretakers should handle animals in a humane and safe manner at all times, taking care to avoid unnecessary pain or distress.

Background: Handling facilities, including trailers, should be well maintained and free of objects that may cause bruising. Broken boards or rails should be fixed. Rails in milking parlors should be properly adjusted. All loading equipment should have non-slip flooring. This is especially important with breeding age animals so as to prevent injury when they are exhibiting signs of estrus.

Verification: Visual assessment of facilities (i.e. milking parlor, hoof trimming chute, loading chute, trailer). Vocalization scoring as an indicator of stress. Visual assessment of animal movement.

Expectation: When transporting animals, distress and discomfort should be minimized. Only animals fit for travel should be transported, unless animals are being transported to seek medical attention. Trucks and trailers used to transport animals should be safe and comfortable for the animals, proper loading densities should be maintained, and equipment should be operated by a trained, competent individual.

Background: Dairy cattle may be moved off of the farm for a variety of reasons. Care should be taken during transport to ensure the well-being of the animal.

Guideline: Recommended loading densities of trucks and parlor holding pens range from 12 square feet per head for 1,000 pound animals to 18 square feet per head for 1,400 pound animals (Grandin, 1981). These densities are not the absolute standard and must be adjusted for calves and special needs animals.

Note: Review "Top 10 Considerations for Culling and Transporting Dairy Animals to a Packing or Processing Facility" for additional information on transporting dairy cattle. This document can be found online at: nmpf.org/files/file/Top_10_Considerations_Electronic_Version.pdf.

Verification: Visual assessment of facilities (i.e. loading chute, trailer). Vocalization scoring as an indicator of stress. Visual assessment of animal movement.

WORKER EDUCATION

Guiding Principle: To promote animal well-being, animal caretakers should be appropriately trained and regularly supervised to ensure they follow protocols and meet professional expectations for appropriate animal care and handling.

Expectation: All individuals working with animals must be trained and regularly supervised to ensure they are competent and educated about protocols and able to follow them. If not, retraining must occur. Animal abuse must not be tolerated. Training (both written and verbal) must be provided in a language that is easily understood, especially in cases where workers are non-native English speakers. Training should be regularly updated to reflect current industry standards.

> Proper management promotes animal health and well-being and reduces the incidence of illness or injury.
>
> To ensure proper management of animals, all individuals responsible for the caring of animals should be trained and regularly supervised.

Background: A key component in facilitating animal well-being is having competent, well-trained employees. It is critical that employees receive training to:

- Recognize and understand basic animal needs .
- Rapidly diagnosis and treat illness or injury.
- Move, handle and transport animals in a manner that minimizes animal distress and is safe for the animal and caretaker.
- Competently perform euthanasia procedures.
- Understand and follow biosecurity measures.

Hired animal caretakers are important to the long-term viability of the dairy industry. It is critical that dairy owners and managers invest in the time to adequately train dairy farm employees. Training should be thought of as an investment into the employee that can mutually benefit the employee, the farm, the community, and the dairy industry at large.

Verification: Visual assessment of employees working. Review training protocols. Talk with employee(s).

Note: Resources for educating employees include the "Farm Animal Worker Training Program" available from the Federation of Animal Science. You can also contact your local veterinarian and/or extension agent to obtain training modules.

REFERENCES

Agriculture Canada. 1990. Recommended Code of Practice for the Care and Handling of Dairy Cattle. Agriculture Canada, Ottawa.

American Association of Bovine Practitioners. 1999. Practical Euthanasia of Cattle: Considerations for the Producer, Livestock Market Operator, Livestock Transporter, and Veterinarian. Online. Available: aabp.org/resources/euth.pdf.

American Veterinary Medical Association. 2008. Principles of Veterinary Medical Ethics of the AWMA. Online. Available: avma.org/issues/policy/ethics.asp#III.

California Dairy Quality Assurance Program - Dairy Welfare Evaluation Guide. 2004. University of California Agriculture and Natural Resources Cooperative Extension.

Caring for Dairy Animals - Technical Reference Guide and On-The-Dairy Self-Evaluation Guide. 2004. Agri-Education, Inc., Stratford, IA.

Dairy Cattle Welfare Critical Control Points. Temple Grandin. Alberta Farm Animal Care. Online. Available: afac.ab.ca/careinfo/handling/Grandinccontrol.htm.

Dairy Management Inc, American Association of Bovine Practitioners, and National Milk Producers Federations. 2008. Top 10 Considerations for Culling and Transporting Dairy Animals to a Packing or Processing Facility. Online. Available: nmpf.org/files/file/Top_10_Considerations_Electronic_Version.pdf.

DeVries, T.J. and M.A.G. von Keyserlingk. 2008. Understanding Cow Behavior from a Nutritional Perspective. Tri-State Dairy Nutrition Conference. Online. Available: tristatedairy.osu.edu/Proceedings%202008/DeVries%20paper.pdf.

Eicher, S.D., J.L. Morrow-Tesch, J.L. Albright, J.W. Dailey, C.R. Young, and L.H. Stanker. 2000. Tail-docking influences on behavioral, immunological, and endocrine responses in dairy heifers. J. Dairy Sci. 83:1456-1462.

Eicher, S.D., J.L. Morrow-Tesch, J.L. Albright, and R.E. Williams. 2001. Tail-docking alters fly numbers, fly-avoidance behaviors, and cleanliness, but not physiological measures. J. Dairy Sci. 84:1822-1828.

Eicher, S.D. and J.W. Dailey. 2002. Indicators of acute pain and fly avoidance behaviors in Holstein calves following tail-docking. J. Dairy Sci. 85:2850-2858.

Eicher, S.D., H.W. Cheng, A.D. Sorrells, and M.M. Schutz. 2006. Short communication: Behavioral and physiological indicators of sensitivity or chronic pain following tail docking. J. Dairy Sci. 89:3047-3057.

Grandin, T. 1981. Livestock Trucking Guide. Livestock Conservation Institute. Bowling Green, KY. Online. Available: grandin.com/behaviour/rec.truck.html.

Grandin, T. 1998. Handling of Crippled and Nonambulatory Livestock. Animal Welfare Information Center Bulletin, Vol. 9, no. 1-2. Online. Available: nal.usda.gov/awic/newsletters/v9n1/9n1grand.htm.

Grandin, T. 2007. Outline of cow welfare critical control points for dairies (rev. March 2007). Grandin Livestock Handling Systems. Fort Collins, CO. Online. Available: grandin.com/cow.welfare.ccp.html.

Graves, R.E. and M.F. Brugger. 1994. Naturally ventilated freestall barns. *Expansion Strategies for Dairy Farms: Facilities and Financial Planning*. NRAES-77, pp. 409-417. NRAES: Ithaca, NY.

Guide for the Care and Use of Agricultural Animals in Agricultural Research and Teaching. First Ed. 1999. Consortium, Association Headquarters, Savoy, IL.

Heinrichs, J. and B. Lammers. 1998. Monitoring Dairy Heifer Growth. Penn State College of Agricultural Sciences. Online. Available: pubwiki.extension.org/mediawiki/files/1/13/Monitoring_Dairy_Heifer_Growth.pdf.

Humane Farm Animal Care. 2004. Humane Farm Animal Care- Animal Care Standards for Dairy Cows March 2004. Herndon, VA. Online. Available: certifiedhumane.org/documentation.asp.

La Fontaine, D. and K. de Witte. 2002. Dehorning and castration of calves under six months of age. Online. Available: transact.nt.gov.au/ebiz/dbird/TechPublications.nsf/C5AF1480C26CC23269256EFE004F648E/$file/804.pdf?OpenElement.

National Dairy Animal Well-Being Initiative. Principles and Guidelines for Dairy Animal Well-Being. Online. Available: dairywellbeing.org/guidelines.php.

National Research Council. 2001. Nutrient Requirements of Dairy Cattle: 7th rev. ed. Natl. Acad. Sci., Washington, D.C.

Schreiner, D.A. and P.L. Ruegg. 2002. Effects of tail docking on milk quality and cow cleanliness. J. Dairy Sci. 85:2503-2511.

Schreiner, D.A. and P.L. Ruegg. 2002. Responses to tail docking in calves and heifers. J. Dairy Sci. 85:3287-3296.

Stull, C.L., M.A. Payne, S.L. Berry, and P.J. Hullinger. 2002. Evaluation of the scientific justification for tail docking in dairy cattle. J. Amer. Vet. Med. Assoc. 220:1298-1302.

Tom, E.M., I.J.H. Duncan, T.M. Widowski, K.G. Bateman, and K.E. Leslie. 2002. Effects of tail docking using a rubber ring with or without anesthetic on behavior and production of lactating cows. J. Dairy Sci. 85:2257-2265.

Tucker, C.B. and D.M. Weary. Tail Docking in Dairy Cattle. Animal Welfare Information Bulletin, Winter 2001- 2002. Vol. 11 No. 3-4. Online. Available: nal.usda.gov/awic/newsletters/v11n3/11n3tuck.htm.

Tucker, C.B., D. Fraser, and D.M. Weary. 2001. Tail docking in dairy cattle: Effects on cow cleanliness and udder health. J. Dairy Sci. 84: 84-87.

Veenhuizen, M.A. 1994. Providing a healthy environment with proper ventilation. *Expansion Strategies for Dairy Farms: Facilities and Financial Planning*. NRAES-77, pp. 418-425. NRAES: Ithaca, NY.

Wildman, E.E., G.M. Jones, P.E. Wagner, and R.L. Boman. 1982. A dairy cow body condition scoring system and its relationship to selected production characteristics. J. Dairy Sci. 65:495-501.

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