

Veterinary Extension Program Activities and Accomplishments: Lameness and Welfare of Cattle

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Lameness of Cattle

Lameness of dairy and beef cattle is an extension program priority. In dairy cattle lameness represents the single most costly clinical disease of dairy cattle (Guard, 2009). It is usually less of a problem in cow/calf herds and stocker cattle operations, and a bigger problem in feedlot steers and heifers. Over the previous 12 month period, we have conducted multiple training programs (under the heading of the ISU Master Hoof Care Program) on foot care and claw trimming to trimmers and dairy farm managers throughout the United States. As profit margins on feeder cattle improve, we anticipate that there will be increased demand for foot care services by the feeder cattle industry. For this to happen, a few gaps in our current understanding of lameness in feeder cattle must be addressed. For example, what are the predominant lameness problems in feedlot cattle, what are the underlying causes, what can we do about them and at what cost? For example, are lameness disorders sufficient to justify the expense of foot care facilities, equipment and training of hospital crews?

The Master Hoof Care Program (now in its 16th year) was designed to address lameness problems on dairies by assuring foot care technicians are properly trained and equipped to handle common lameness disorders. Programs are conducted in both English and Spanish to address the needs of the dairy industry's multi-cultural workforce. We will develop similar programs for the feedyard industry. Current format consists of ½ day of classroom and 1 - 2 days of claw trimming on cadavers and live animals.

In addition to formal training programs such as the Master Hoof Care Program, we are frequently called upon to offer training programs specific to individual dairy operations. Large dairies with multiple farm units frequently have 5 to 10 people serving the foot care needs of the operation. These operations prefer on-farm training of their employees so that they may be trained under their farm conditions, with disorders and equipment familiar to their workers. Demand for these programs continues to grow and with few programs like ours it is anticipated that these opportunities will expand.

Despite the significance of lameness on performance, profit and animal welfare of cattle, it remains one of the most neglected issues in veterinary education. In fact, at some institutions students will receive at most 1 or 2

lectures on the subject of lameness in the course of their 4 year education. To say this is woefully inadequate is an understatement. Therefore, one of the objectives of our program has been to provide as requested training in foot care to veterinary students throughout the US. In most cases, these are conducted on weekends and organized by student organizations. This past year training programs were provided to veterinary students at Iowa State University, the University of Minnesota, Kansas State University and the University of Florida.

Beyond the above described activities are multiple on-farm visits, email and phone consultations with veterinarians, dairy managers and owners, feedyard operators and hoof trimmers from across the country.

Research Related to Extension Program: Emphasis in Lameness

1. Boehringer Ingelheim, Pathogenesis of Digital Dermatitis in Cattle. Adam Krull, Paul Plummer, Pat Gorden, Jan Shearer and Bruce Leuschen. \$40,000.
2. Alberta Beef Producers. Prevalence, characterization and risk factors associated with lameness within Alberta feedlots. Karen Schwartzkopf-Genswein, Diego Moya, Eugene Janzen, Ed Pajor, Carl Dueck, Phil Klassen, Mike Jelinski, Craig Dorin, Karin Orsel, Suzanne Millman, Jan Shearer, and Christoph Muelling. \$130,000.

Welfare Issues of Cattle

1. This past year was my sixth and final year as a Board member of the Professional Animal Auditors Certification Organization (PAACO), an organization dedicated to the certification of audits and auditors, auditor training and the promotion of quality auditing for the livestock industry. I have served as Chair of the Dairy Audit Review Committee which has certified 2 dairy welfare audits. For an audit to be certified by PAACO it must be consistent with the principles and guidelines of the National Dairy Animal Well-Being Initiative (NDAWI) and comply with PAACO's minimum standards for welfare audits.
2. Chair of the AVMA Panel on Euthanasia Food Animal Working Group. - I am responsible for the food animal groups' (dairy, beef, small ruminant, swine, and poultry) submissions for this document. The AVMA Guidelines on Euthanasia are a comprehensive review of current research on euthanasia of animals. The final document has been reviewed and is now in press with a publication date planned for the first quarter of 2012.

3. I am currently providing leadership for the preparation of the AABP Euthanasia Guidelines and will be serving on both the AVMA Panel on Depopulation and the AVMA Panel on Humane Slaughter.
4. Organizing Committee of the American College of Animal Welfare – a proposed Veterinary Medical Specialty Board – the petition has been submitted recognition by the AVMA is pending. Should this become a recognized Specialty Board in Veterinary Medicine, ISU will be positioned to establish graduate and residency programs to prepare candidates for Diplomate status in the American College of Animal Welfare.
5. Other welfare related activities include: Member of the Scientific Review Committee of the Humane Farm Animal Care, Member of the Dean Foods Animal Welfare Advisory Council, Member of the Validus Scientific Advisory Committee and as of this next year will undergo training to become an On-Farm Welfare Assessor and Auditor for Validus.

Research Related to Extension Program Emphasis: Welfare of Cattle (Euthanasia)

1. USDA APHIS - Development and Validation of a Portable Pneumatic Captive-Bolt Device for the Depopulation of Dairy Cattle For use in Animal Health Emergencies and Welfare Depopulations. Jan Shearer, James Reynolds, Grant Dewell, Renee Dewell and John Gilliam. \$418,042.
2. USDA APHIS - Development and Validation of a Portable Pneumatic Captive-Bolt Device for the Depopulation of Dairy Cattle For use in Animal Health Emergencies and Welfare Depopulations. James Reynolds and Jan Shearer. \$418,042.
3. USDA APHIS - Captive Bolt Euthanasia of Cattle: Determination of Optimal Shot Placement and Evaluation of the Cash Special Euthanizer Kit for Euthanasia of Cattle. John Gilliam (Oklahoma State University), Jan Shearer, Jennifer Woods, Jeff Hill and James Reynolds. \$199,850.
4. USDA NIFA AFRI Competitive Grants Program. An examination of argon gas for on-farm anesthesia and euthanasia of livestock. Suzanne Millman, Anna Butters-Johnson, Renee Dewell, Locke Karriker, Annette O'Connor, Jan Shearer and Hongwei Xin. \$500,000.

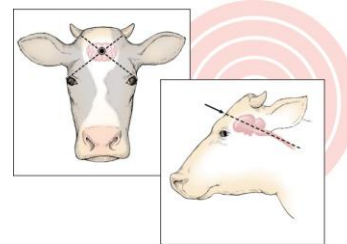
Program Activities and Accomplishments

Efforts over the past year have been consumed by the previously described activities. In addition, I have been invited to be a participant in >50 educational programs of which ~ 30 have been on the topic of animal welfare and/or euthanasia. One component of this is timely euthanasia. This topic is covered in depth for several livestock species at the website below. This website contains information on proper application of euthanasia in field conditions by

gunshot and captive bolt. It includes animations for assistance in training these techniques and will contain an updated version in Spanish very soon. In addition, we have conducted ~20 programs on foot care for farm employees, trimmers, and veterinarians and/or veterinary students.

<http://vetmed.iastate.edu/vdpam/extension/dairy/programs/humane-euthanasia>

Anatomical Landmarks in Cattle In cattle, the point of entry of the projectile should be at the intersection of two lines, each drawn from the outside corner of the eye to the base of the opposite horn (OIE, 2009). The firearm should be positioned so that the muzzle is perpendicular to the skull to avoid the possibility of ricochet. Proper positioning of the firearm or penetrating captive bolt is necessary to achieve the desired results.



Use of the poll position (top of the head) for stunning or euthanasia of cattle is not allowed by regulations in the European Union because the depth of concussion in this region is less than that observed in frontal sites. Furthermore, aiming or directing or the projectile to the regions of the brain that control vital functions such as respiration and heart function are more easily missed by use of the poll position for euthanasia in cattle.

Gunshot is the method most commonly used for on-farm euthanasia of cattle (Fulwider et al., 2008). Death results from mass destruction of brain tissue. For euthanasia purposes, handguns are limited to close range shooting (within 1 to 2 feet or 30 to 60 cm) of the intended target. Shotguns loaded with either birdshot or slugs are appropriate from a distance of 1 to 2 yards (1 to 2 meters) and rifles from a longer distance if required. Although all shotguns are lethal at close range, the preferred gauges for this procedure in cattle are the 20, 16, or 12 gauge shotguns. Number 6 or larger birdshot or shotgun slugs are the best choices for euthanasia of cattle. It is important to note that birdshot begins to disperse as it leaves the end of the gun barrel. However, if the operator stays within short range (i.e. within 6 to 10 feet of the target) of the intended anatomical site, destruction of the brain will be sufficient to result in rapid death. One advantage of euthanasia by shotgun with birdshot shells is that it is unlikely that any of the birdshot will exit the skull. In the case of a free bullet or shotgun slug there is always the possibility of the bullet or slug exiting the skull placing by-standers in danger.

Awards or Special Recognition

Recipient of the AVMA Animal Welfare Award for 2011.