



# FACT SHEET: SUSTAINABILITY

# BEEF RESEARCH

## Beef Cattle Welfare in the United States

*Cassandra Tucker, University of California, Davis*

*Hans Coetzee, Iowa State University*

*Karen Schwartzkopf-Genswein, Agriculture and Agri-Food Canada, Lethbridge Research Centre*

*Joe Stookey, University of Saskatchewan*

*Temple Grandin, Colorado State University*

*(Report completed June 2013)*

Animal welfare plays an important role in agriculture. The scientific study of animal welfare can inform best practice on farm and will allow decisions to be made based on evidence and measured outcomes, rather than solely on perceived ethical concerns.

A checkoff-funded white paper, *Beef cattle welfare in the United States: Identification of key gaps in knowledge and priorities for further research*, strategically reviews the scientific information about the welfare of beef cattle in the United States and identifies opportunities on a variety of cattle welfare topics. This fact sheet briefly summarizes the wide array of findings.

Eight broad categories of animal welfare in beef production emerged.

- 1. Nutrition and growth:** This section of the review considers animal welfare concerns associated with abrupt weaning and separation from the dam, nutritional diseases caused by high-concentrate feeding, the use of body condition score to evaluate adequate nutrition or disease, and production-related technologies (antibiotics, ionophores, hormonal treatments and  $\beta$ -adrenergic agonists). Additional research is needed in all of these areas to more clearly determine the effects of current practices and evaluate alternative practices.
- 2. Health:** This review focused on two health problems, Bovine Respiratory Disease (BRD) and lameness. The risk factors for BRD are well understood but research is needed to improve detection and preventative strategies. Lameness has received considerably less

attention in the published literature but is a concern since it is known to be painful. Knowledge about the prevalence and risk factors of lameness combined with evaluations of treatment effectiveness is needed.

- 3. Painful procedures:** The most prevalent painful procedures which cattle undergo are castration, dehorning and branding. In this section, the authors discuss the rationale behind these three practices and review current strategies for mitigating the associated pain. Challenges in providing analgesia to cattle include: the fact that no drugs are currently approved for pain alleviation, the delay between the time of drug administration and the onset of analgesic activity, and longer processing times. Additional research is needed to facilitate regulatory approval of analgesics and evaluate the potential health and performance benefits from administering analgesia.
- 4. Winter:** There is evidence that muddy and wet conditions, wet lying areas and environments with severe winters affect cattle performance but more research is required to properly apply mitigation, including mound design and management.
- 5. Heat:** Changes in cattle behavior, physiology and production as well as death can result from heat load. Two management strategies are commonly implemented to reduce heat load in beef cattle – shade provision and cooling with water. Neither option is commonly practiced in feedlots. It has been shown that cattle will benefit from shade and water cooling well before changes in their feeding habits



BeefResearch.org



303.694.0305



Funded by the Beef Checkoff.

and body temperature demonstrate stress. Research is needed to identify optimal heat abatement best practices in feedlots and cow-calf operations.

6. **Social interactions:** Mixing or comingling of unfamiliar cattle is a common practice in the feedlot industry. Evidence suggests this practice may contribute to stress, aggression (a contributor to dark cutters), and the buller steer syndrome, a problem with an annual incidence between 2 and 4%. Additionally, high stocking density may contribute to aggression and slower rates of gain. Research is needed to determine best management strategies for grouping unfamiliar animals.
7. **Transport:** Several factors influence the effects of transportation on cattle including space allowance, feed and water withdrawal, environmental conditions, and animal type and temperament. Research is needed to clearly understand the effect of these factors on cattle welfare.
8. **Slaughter:** Slaughter is a considerably improved area of animal welfare concern. However, research is required to understand the relationship between kill method, pain and sensibility.

- Understanding risk factors for health problems that are poorly studied at the population level, such as lameness and the effect management has on both rare and more common diseases (e.g. sub-acute ruminal acidosis). Epidemiological work in this area is the first step to understanding how we may prevent these problems across the entire industry and would provide insight into the long-term effects of management decisions such as weaning method, transition to high-concentrate diets and pain mitigation.
- Understanding the welfare implications of specific practices during transport: limited feed, water and rest intervals (both with and without unloading) and long duration of travel under extreme climatic and management conditions.

#### **Highest priority (longer-term):**

- Research is required to identify science-based recommendations about stocking density in feedlots for key resources: dry lying areas (mounds), shade, water and feed year-round. This work is needed at a commercial scale, using industry-relevant group sizes and multiple measures of welfare, with particular emphasis on animal behavior, as these dependent variables provide insight into competition for, and simultaneous use of, these resources.
- Understanding the welfare implications of aspects of trailer design, including optimal loading densities by animal type and weather, trailer design features that control environmental conditions (ventilation, use of bedding, boarding), internal ramp and compartment construction.

### **Research priorities to advance science-based recommendations about beef cattle welfare**

#### **Highest priority (immediate):**

- Evaluation of the animal welfare implications of technologies used to either promote growth or manage cattle in feedlots, particularly  $\beta$ -adrenergic agonists, hormonal implants, immunocastration and melengestrol acetate (MGA).

---

## **Reference**

Source: Tucker, C., H. Coetzee, K. Schwartzkopf-Genswein, J. Stookey, T. Grandin, and D. Thomson. 2014. Beef Cattle welfare in the United States: Identification of key gaps in knowledge and priorities for further research. [www.beefresearch.org](http://www.beefresearch.org)

*For more information, contact:*

Science and Product Solutions  
National Cattlemen's Beef Association  
Contractor to the Beef Checkoff Program  
9110 East Nichols Avenue  
Centennial, CO 80112  
303.694.0305

Copyright © 2014 Cattlemen's Beef Board and National Cattlemen's Beef Association.  
All rights reserved.



BeefResearch.org



303.694.0305



Funded by the Beef Checkoff.