



Stress Factors of Farm Animals and Effects on Performance

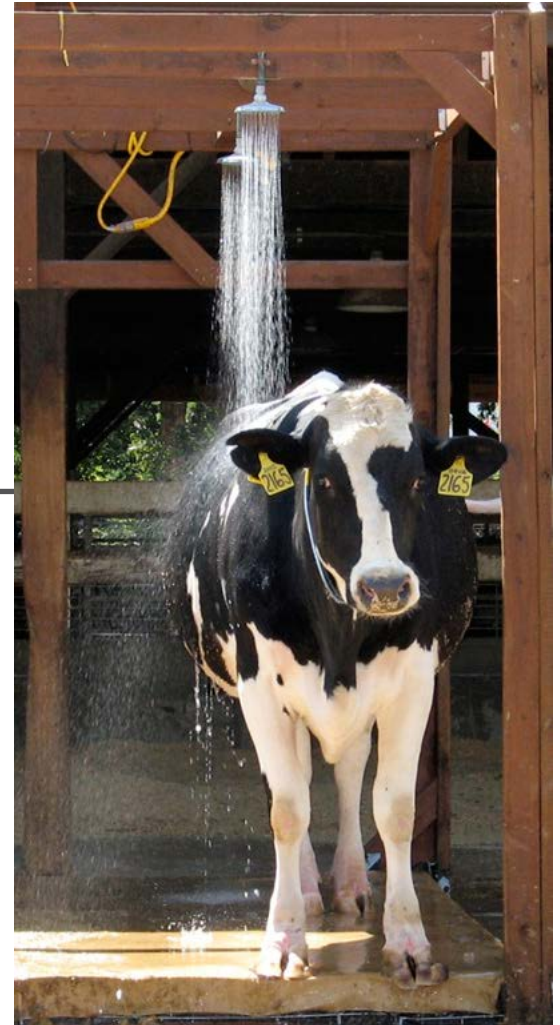
This project has enhanced our understanding of stressors that impact domestic farm animal productivity; of factors that act as intermediaries to stress responses; and of management practices that can relieve stress within the environment to enhance animal comfort and maintain a secure, productive, and low-cost food supply.

Who cares and why?

Environmental and management stressors erode efficiency and cost livestock production enterprises billions of dollars annually in lost potential profitability. For example, in the absence of heat abatement measures, total losses across all animal classes averaged \$2.4 billion annually as of 2003. Of the total, reduction in milk production potential represented a major portion of the losses to the dairy industry, which average between \$897 million and \$1.5 billion. Adverse weather conditions, including the effects of hot and cold climatic conditions, are particularly difficult for confinement beef cattle feeding enterprises.

What has the project done so far?

Outputs of the project's collaborations are documented by the researchers' commitment to dissemination and publication of research results via national and international activities in the last four years. Project members have published 97 peer-reviewed manuscripts and 144 other scientific papers. Nearly all of these documents contain shared authorship among participating project stations. Ongoing accomplishments of the group are a result of interactions among research scientists trained in a variety of disciplines and with expertise in a broad range of livestock species. This comparative and multi-disciplinary approach uniquely facilitates the expansion of research capabilities among group participants. Project researchers are regular participants and/or invited speakers in special sessions and symposia on the biology of stress in livestock at national and international meetings. They have published collaborative review articles aimed at addressing updates and/or changes in guidelines for livestock and are working collaboratively on resource materials for a textbook, *Thermal Biology of Domestic Animals*, to be published in 2012. Members routinely share resources and expertise in research, and this has led to significant interactions among project participant laboratories, multi-institutional research projects, and joint meetings with other multi-state working groups with related focus areas. The collaborative interdependence among stations originally envisioned for multi-state projects is prominent in this research group.



The U.S. dairy industry loses around \$1 billion each year as a result of heat stress. "Cow showers" may help reduce this stress by giving animals the opportunity to use water to cool down. Photo by Sylvia Wright/UC Davis.

Impact Statements

Advanced understanding of the biology of stress response components and measures of animal well-being, giving researchers a basis for predicting when an animal is under stress or distress and in need of attention.

Identified management practices that improve animal environments and reduce the potential for animal stress.

Shared information and recommendations with farmers and industries, helping them reduce animal stress and increase animal productivity, resulting in increases in net income for livestock enterprises.



Researchers study shade use to understand how environmental conditions can be modified to reduce stress on dairy cattle. Photo by Cassandra Tucker.

What research is needed?

The future research needs for this group are to identify strategies for developing and monitoring appropriate measures of animal stress and well-being; assess genetic components, including genomics and proteomics, of animal stress and well-being; and develop alternative management practices to reduce stress and improve animal well-being and performance. These research needs will be addressed through collaborative research efforts by participating members of W-1173.

Want to know more?

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Edited and designed by Sara Delheimer
