

Integrated Program for Reducing Bovine Respiratory Disease Complex in Beef and Dairy Cattle Coordinated Agricultural Project (BRD CAP)



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United States
Department of
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National Institute
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The National Institute of Food and Agriculture (NIFA) is an agency within the U.S. Department of Agriculture (USDA), part of the executive branch of the Federal Government. Congress created NIFA through the Food, Conservation, and Energy Act of 2008. NIFA replaced the former Cooperative State Research, Education, and Extension Service (CSREES), which had been in existence since 1994.

The Agriculture and Food Research Initiative (AFRI) is NIFA's flagship competitive grant program and was established under the 2008 Farm Bill. AFRI supports work in six priority areas: plant health and production and plant products; animal health and production and animal products; food safety, nutrition and health; renewable energy, natural resources and environment; agriculture systems and technology; and agriculture economics and rural communities.

AFRI's global food security challenge area focuses on two intertwined issues: food availability and food accessibility. Adequate food availability implies that the population has a reliable source of food from domestic or international production. For adequate food accessibility, the population must have sufficient resources to purchase food for a nutritious diet. The long-term goal of this program is to increase global food availability through increased and sustainable food production with reduced losses.





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USDA Awards Grants to Improve Cattle Production and Health

COLUMBIA, Mo., April 15, 2011 – Roger Beachy, director of the U.S. Department of Agriculture’s National Institute of Food and Agriculture (NIFA), today announced two grant awards to the University of Missouri and Texas A&M University to support research, education and outreach on cattle production to increase global food security.

“The United States is the world’s largest producer of beef and milk and has the largest fed-cattle industry in the world,” Beachy said. “As the demand for food rises due to a growing global population, it will be critically important to develop methods to produce more food with greater efficiency, while lowering the prevalence of bovine respiratory disease that inflicts significant losses each year.”

NIFA also awarded a **\$9.75 million grant** to Texas A&M University to support research led by Dr. James Womack to reduce the prevalence of bovine respiratory disease (BRD) in beef and dairy cattle. BRD is the leading natural cause of death in beef and dairy cattle, causing annual losses of more than 1 million animals valued at nearly \$700 million.

Womack and colleagues will use a DNA-based approach to identify cattle that are resistant to disease-causing pathogens. In addition to studying known pathogens, they will identify novel pathogens responsible for BRD. The data will be used to develop BRD diagnostic tests and genetic selection tools to identify BRD-resistant animals, while also assessing the welfare of cattle with BRD. The researchers intend to share their results with producers and develop undergraduate courses and related educational materials and instruction for 4-H youth.

Womack’s team includes scientists from the University of California-Davis, Colorado State University, the University of Missouri, New Mexico State University, Washington State University and USDA’s Agricultural Research Service.

Integrated Program for Reducing Bovine Respiratory Disease Complex (BRDC) Beef and Dairy Cattle



BRDC Industry and Scientific Advisory Board



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Our goal is to integrate research, education, and extension activities to develop cost-effective genomic and management approaches to reduce the incidence of BRD in beef and dairy cattle

The objective of this multi-institutional project is to reduce the incidence of bovine respiratory disease by:

- Capitalizing on recent advances in genomics to enable novel genetic approaches to select for disease-resistant cattle
- Developing improved DNA-based tests for disease diagnosis
- Providing educational opportunities for undergraduate, graduate and veterinary students to generate a future human resource for the continued reduction in bovine respiratory disease incidence
- Producing and delivering a variety of educational materials for beef and dairy cattle producers, and feedlot personnel on best management practices to reduce disease incidence





RESEARCH HYPOTHESIS: Genetic selection for resistance to BRD coupled with improved animal health management can provide a significant, sustainable, and profitable reduction in the prevalence of BRD.

1. Identify genomic regions associated with BRD resistance/susceptibility in beef and dairy cattle.
2. Identify the interaction of the cattle genome with the pathogens responsible for BRD.
3. Identify novel pathogens present in animals with BRD, and develop pathogen diagnostic panel
4. Develop BRD Genetic Selection Panel.
5. Develop genomic estimates of breeding values for resistance to BRD.
6. Assess the effect of administering NSAID to modulate BRD and improve welfare and recovery







EDUCATION HYPOTHESIS: Didactic and experiential learning approaches describing the complex issues associated with BRD in the cattle industry will be most effective in preparing students to make the management decisions needed to reduce BRD impact.



1. Develop a nationally accessible distance-learning course on the integration of animal health management with genomic and animal breeding approaches to reduce livestock disease.
2. Develop an undergraduate summer research internship program, with an emphasis on students from minority-serving institutions, to expose and train them in multidisciplinary integrated research to reduce BRD prevalence.
3. Develop a veterinary feedlot and dairy internship program.
4. Sponsor graduate and undergraduate students to attend the Southern Great Plains Dairy Consortium where extension and research activities will be ongoing.
5. Develop a 4-H curriculum to expose and train youth on animal disease using BRD as an example application.





EXTENSION HYPOTHESIS: An integrated multidisciplinary approach to reducing BRD will be more successful than approaches which address only one aspect of the disease or a single sector of the cattle industry.



- 1. Utilize existing extension networks to integrate producers, industry, veterinarians, researchers, graduate and veterinary students in the BRD research trials.**
- 2. Produce a variety of educational materials for beef and dairy cattle producers, and feedlot personnel on best management practices to reduce disease incidence**
- 3. Deliver educational programs on best management practices for integrated and economically sustainable animal health management, genomic, and animal breeding approaches to reduce BRD.**

Looking for feedback from Academy of Veterinary Consultants

- **Development of a BRD diagnostic assay**

What type of rapid and sensitive test to enhance the clinical diagnosis of BRD would be the most useful?

- **Extension and outreach needs**

What educational materials for beef and dairy cattle producers, and feedlot personnel would be most useful to reduce disease incidence?





United States Department of Agriculture
National Institute of Food and Agriculture

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