Integrated program for reducing bovine respiratory disease complex in beef and dairy cattle coordinated agricultural project (BRD CAP).

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The BRD CAP is a 5-year USDA-funded Coordinated Agricultural Project to address the problem of BRD in dairy and beef cattle. This multi-institutional team, led by Dr. James Womack at Texas A&M University, collaborates to conduct a combination of BRD-related research, education, and extension activities. One of the primary research aims of the BRD CAP is to reduce the prevalence of BRD in beef and dairy cattle through the identification of genetic loci associated with host susceptibility to BRD, and to use this information to develop DNA-based selection tools. Numerous approaches are being employed to achieve this goal including two large genome wide association studies (GWAS) on beef and dairy cattle, the identification of DNA structural variants that have major effects on BRD susceptibility; gene expression studies from challenged animals to identify genes differentially expressed in cattle in response to BRD pathogens; analysis to identify important biological pathways in BRD susceptibility; and animal behavioral studies have been conducted to determine how BRD impacts animal welfare. Future work includes validation of the chromosomal regions and SNPs that have been identified as important for BRD susceptibility, fine mapping of chromosomes to identify causal single nucleotide polymorphisms (SNPs), and integration of predictive markers for BRD susceptibility into genetic tests and national cattle genetic evaluations. The educational team is focused on developing online graduate level courses on the integration of animal health management with genomic and animal breeding approaches to reduce livestock disease, sponsoring undergraduate students to attend the Southern Great Plains Dairy Consortium (sgpdct.tamu.edu), and the development of graduate and undergraduate internships to expose students to multidisciplinary integrated research to reduce BRD prevalence. The extension team is developing outreach materials on best-management practices to reduce BRD incidence in both the dairy and beef industry, providing content on BRD to eXtension, working with dairy and beef cooperators interested in improving their BRD management, and evaluating the economic impact of BRD on dairy and beef operations. For more information see the website http://www.brdcomplex.org.