National Dairy Genetic Evaluation Program

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The National Dairy Genetic Evaluation Program is a continuation of a USDA collaboration with the U.S. dairy industry on genetic evaluation of dairy cattle that has been ongoing since 1908. Data are provided by dairy records processing centers (yield, health, pedigree, and reproduction traits), breed registry societies (pedigrees and genotypes), and artificial-insemination organizations (pedigrees, reproduction data, and genotypes) for inclusion in the national dairy database maintained by USDA's Agricultural Research Service at the Animal Improvement Programs Laboratory (AIPL). Using those genomic and phenotypic data, genetic progress of U.S. dairy animals is analyzed by AIPL for economically important traits (milk and component yields, component percentages, longevity, mastitis resistance, fertility and calving traits, and conformation) and genetic-economic indexes for overall merit, fluid milk and cheese yield. That information is made available to the dairy industry (including individual dairy producers) through the AIPL Web site for use in breeding and other management decisions to improve milk production of future generations of dairy animals and thus the efficiency of the national dairy herd and prices of dairy products. A more efficient national herd also provides dairy products with a smaller cattle population, thereby reducing any adverse environmental impacts and conserving natural resources. Annual milk yield of 9.1 million U.S. cows today is more than 21,000 pounds per cow compared with less than 9,500 pounds for 12.5 million cows in 1970; more than 60% of that gain is attributable to genetics.
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Center for Nutrition and Pregnancy (CNP)

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The CNP was established in 2002 with an overall goal to use animal models to increase the proportion of healthy, productive offspring by ensuring an optimal maternal environment during pregnancy and lactation. Various factors—such as poor maternal nutrition, maternal activity/exercise, maternal social or environmental stress, maternal age, maternal or fetal genotype, singleton vs. multiple fetuses/offspring, sex of fetus/offspring, and assisted reproductive technologies, including in vitro fertilization and cloning,—all can lead to low-birth weight, and thereby contribute to the high neonatal mortality (8 percent to 10 percent) in livestock and humans in the United States. Moreover, growth restricted offspring may be at risk not only of postnatal complications but also may be "programmed" to develop metabolic syndrome, poor growth, inappropriate body composition, immune dysfunction, reproductive failure, and poor cognitive development, as well as a host of other significant problems later in life. This concept has been termed "Developmental Programming." In humans, it may perpetuate health problems and social difficulties over generations; in livestock, it may impact meat, milk and fiber production and hence economic returns. Because of the potential socioeconomic impact of Developmental Programming, CNP has received funding from a variety of state and federal agencies, as well as private companies. Since its inception, CNP has become one of the premiere centers in the United States addressing Developmental Programming, and currently involves 15 key investigators and 26 collaborators from throughout the United States and the world.
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USDA National Agroforestry Center (NAC)

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NAC is a long-standing partnership between USDA's Forest Service (Research & Development and State & Private Forestry mission areas) and USDA's Natural Resources Conservation Service. The Center develops and delivers science, tools and training on a broad suite of agroforestry practices for natural resource professionals who work directly with farmers, ranchers, woodland owners and communities nationwide. Through its R&D and Technology Transfer programs, NAC cooperates with a national network of agencies, universities/extension,