About the U.S. Dairy Forage Research Center

Unique in Our Field

The U.S. Dairy Forage Research Center is one of about 90 locations in the Agricultural Research Service (ARS) of the U.S. Department of Agriculture (USDA). Its strength lies in a multidisciplinary and integrated approach to research that includes soil, forage crops, forage management, ruminant nutrition, manure management, and environmental sustainability.

The research is led by 20 scientists in the following disciplines:

- Dairy Science
- Agronomy
- Plant Genetics
- Plant Physiology
- Chemistry
- Animal Genetics
- Soil Science
- Molecular Genetics
- Microbiology
- Agricultural Engineering

plant research

air quality research

nutrition research

grazing research

Research Vision and Mission

Vision: Leading the world in integrated dairy forage systems research.

Mission: Providing dairy industry solutions for food security, environmental sustainability, and economic viability. We build uniquely valuable, science-based research initiatives focused on improving dairy production systems, soil ecology, forage production, forage quality, nutrient management, and ecosystem services.

The research revolves around four themes:

Dairy Forage: To enhance the productivity, efficiency and environmental sustainability of integrated dairy and forage systems through development of improved and adapted traditional and novel forages and management strategies.

Dairy Nutrition: To enhance the production capacity, efficiency, product quality and sustainability of integrated dairy systems through better understanding and management of plant and animal physiology, intensive forage production, resource and nutrient conservation practices, and enhanced eco-system services.

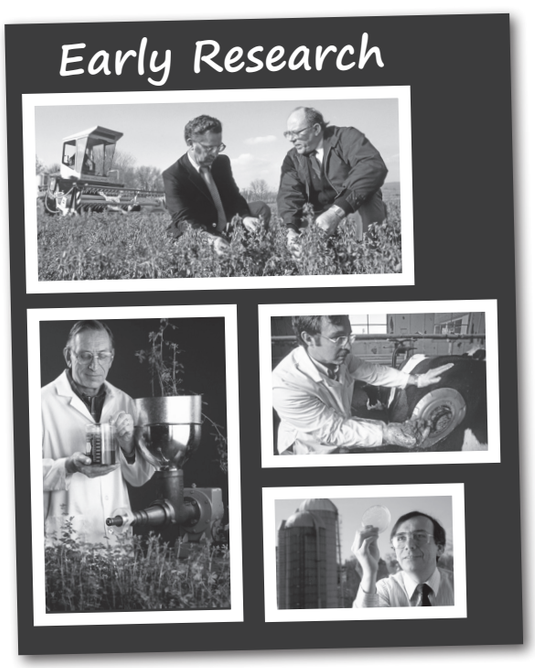
Dairy Environment: To reduce the environmental footprint of the U.S. dairy industry and maximize relevant ecosystem services through research and technology transfer initiatives addressing the prominent bio-physical, socio-economic and operational features of dairy production systems.

Integrated Dairy Systems: To improve the production capacity, efficiency, and the economic and environmental sustainability of diverse, integrated dairy production systems through the development and/or parameterizing of biophysical models, analytical tools, forage production systems, and eco-system services.

The Beginning

Recognizing the importance of high-quality forage to dairy cattle diets – and the challenges of producing that forage – farmers and industry supporters championed the cause of a research facility dedicated to improving forage use by dairy cattle. Their work came to fruition when the USDA ARS built the U.S. Dairy Forage Research Center (USDFRC) in 1981.

The main laboratories, offices, green houses, and engineering lab were built on the west side of the University of Wisconsin-Madison campus. And the research farm was built about 30 miles to the northwest near Prairie du Sac, WI. Years later, because of the need to develop scientific research to find environmentally sound answers to manure management questions, Congress appropriated funds to build research laboratories and offices at Marshfield (completed in 2008) and Stratford (completed in 2011).



USDA & University of Wisconsin Collaboration

In addition to the USDFRC being located on the UW-Madison campus, many of the Center's scientists are on the UW faculty; many serve as advisors for graduate students; and the USDFRC employs many UW undergraduate and graduate students.

The UW connection is especially strong at the research farms (Prairie du Sac and Stratford, WI) which operate jointly with the university's College of Agricultural and Life Sciences, Agricultural Research Stations. The UW owns the dairy cattle at both locations and uses revenue from the farm to offset operating costs and to pay the state employees who work at the farms. At Prairie du Sac, the USDA owns the land and buildings and oversees the cropping enterprise. At Stratford, the UW owns the land and heifer facilities and oversees the cropping operation while the USDA owns the cow barn, milking facilities, and manure handling equipment. Scientists from both institutions conduct research at both farms, often in a highly efficient collaborative manner.

Impact of Research

Five examples of how USDFRC research has impacted the dairy forage industry:

1. Reducing excessive phosphorus in dairy diets has saved the U.S. dairy industry an estimated $109 to $182 million annually and reduced the amount of phosphorus lost to the environment.
2. Reducing excessive protein in dairy cattle diets has saved the U.S. dairy industry at least $740 million annually in reduced protein supplement purchases, and it has reduced the amount of nitrogen being lost to the environment.
3. Reducing dry matter and nutrient losses in silage bunkers and piles is valued at $150 million annually for the U.S. livestock industry for every five percentage points of silage dry matter saved.
4. Improving forage digestibility through a public/private partnership formed to develop a reduced-lignin alfalfa. A 10% improvement in fiber digestibility of forage leads to: 1) increased milk and meat production worth about $350 million in the U.S. annually; and 2) decreased feed supplement costs worth about $250 million in the U.S. annually.
5. Improved digestibility in grass and legume varieties helps cows produce more milk worth about $130 million annually in the U.S. And improved management practices developed at the USDFRC increase pasture forage production by $120 million annually for all U.S. grazing-based dairy farms.

reducing N & P losses

reducing silage losses

improving pastures