

# Farm at Prairie du Sac, WI

The U.S. Dairy Forage Research Center Farm is located about 30 miles northwest of Madison on gently sloping acres bordering the Wisconsin River near Prairie du Sac, WI. The 2,200-acre, 390-cow dairy farm is an integral part of the research effort.



View of the farm, built in 1980, with the Wisconsin River in the background.

## UW Connection

The farm operates jointly with the University of Wisconsin–Madison College of Agricultural and Life Sciences, Agricultural Research Stations. The UW owns the dairy herd and uses revenue from the farm to offset operating costs and to pay the state employees who work at the farm. The dairy herd and research facility are also available to UW-Madison agricultural scientists.

## Crops, Plots and Research

Most of the 2,200 acres at the farm produce feed for the dairy herd. In turn, the fields are fertilized by manure from the cattle in a natural cycle. Regular farm fields are also used to study cropping systems and manure management. Smaller research plots are used for grazing research, as plant nurseries, and to grow small amounts of forage needed for digestion and nutrition research.

Crops grown on the farm include corn for grain and silage, alfalfa for silage and hay, soybeans, and winter wheat. There are also about 20 acres of pasture for Management Intensive Grazing research, and several acres of open pasture used to graze heifers for about 6 months each year. In addition, about 450 acres consist of woodlands, roads, and buildings.



field-scale research



plant breeding plots

## The Herd and Research

There are about 390 lactating cows on the farm. Livestock housing includes both tie-stall and free-stall barns. Cows are milked three times a day. The rolling herd average (a measure of milk production) is about 29,000 pounds of milk per cow per year – or 3,372 gallons – at 3.72% butterfat and 3.01% protein.



collecting rumen fluid

Cows in free-stall barns are fed from a TMR (total mixed ration) wagon. In the tie-stall barns, several small TMR carts are used to mix and deliver research diets to selected cows.

The herd is used for various nutrition and digestion studies designed to better understand how dairy cattle utilize forages and other feedstuffs. Yearling heifers are used for grazing research. The herd has several cows that have been surgically cannulated with an opening that allows researchers to remove partially digested feed from the cow's rumen. The cows are perfectly content with this procedure.



pasture research



individual feed tubs

## Studying Environmental Impacts

Much of the research at the U.S. Dairy Forage Research Center is designed to help improve the economic and environmental sustainability of dairy forage farm systems – which often go hand in hand. Special facilities have been built at the farm to assist with environmental research.

For example, one barn contains four air emissions chambers for up to 12 cows. Researchers are able to qualify and quantify all emissions and compare how they vary with changes in feed, bedding, or stage of lactation. And engineered barnyards enable researchers to collect and compare air emissions, runoff, and leachate from three



different barnyard surfaces in an effort to find the best management options for reducing environmental impacts of outside cattle holding areas.

## New FarmLab

In 2016, the USDFRC created a new position at the farm, that of an Ecologist who is creating a whole-farm, outdoor laboratory to study farm management at the intersection of agriculture and conservation. The vision for the FarmLab is “a model production dairy system that advances dairy sustainability through integrated agroecosystem research and outreach.”

USDFRC staff and collaborators are collecting information about the land base at Prairie du Sac and writing a draft land use plan that will be the basis for identifying new research and outreach opportunities and for renovation of lands that are overwhelmed with invasive shrub cover. The objectives of the FarmLab are to explore the ecological and economic trade-offs associated with whole-farm management, and to inform dairy sustainability through development of metrics of performance of different land use and land management practices.

## Unique Heritage

Efforts to establish a USDA dairy forage research facility date back to the late 1950s. But it wasn't until the 1970s when planning began for this facility and Congress appropriated the funds. Construction of the farm facilities began in 1980; this same year the first animals were brought to the farm.



farming in Badger



part of original herd

The land on which this farm is located has a rich and unique history. First inhabited by Native Americans, European settlers began converting it to farmland in the 1830s. Then, at the dawn of the U.S. entry into World War II, the Department of Defense confiscated the land from 80 farm families in order to build a munitions factory. Known as the Badger Army Ordnance and later the Badger Army Ammunition Plant (BAAP), the facility manufactured gun and rocket powder during three wars and was put on standby status in 1976.

In the late 1970s when the USDA was looking for a site for this research farm, it chose the BAAP location because it could obtain a special permit through the U.S. Department of Defense to farm about 1,500 acres of the undeveloped areas in the 7,354-acre BAAP site; no privately owned land needed to be purchased.

The BAAP remained on standby status until 1997 when the U.S. Army determined that it was no longer needed to meet the nation's defense needs. Thus began a long process to determine how the land would be transferred to new owners. Local cit-

izens developed a “Badger Reuse Plan” which called for the land to be divided between the U.S. Dairy Forage Research Center (which already had been farming part of the land for decades); the Wisconsin Department of Natural Resources (which manages the adjacent Devil's Lake State Park and is creating the Sauk Prairie Recreation Area with its share of the land); and the Ho-Chunk Nation (which has ancestral and cultural ties to the land).

## Contributing to the Community

The U.S. Dairy Forage Research Center strives to be a good neighbor in the Sauk Prairie area. The farm is open for tours with 500 to 1,500 visitors each year, including many local school groups, from preschools to high schools. The farm hosts special events like the Sauk County Dairy Breakfast in 2004 and 2015, and the North American Manure Tech Expo in 2001, 2003, 2007 and 2012. And it welcomes the Sauk County Institute of Leadership (SCIL) group every year.

The U.S. Dairy Forage Research Center was active in the Badger Reuse Plan process from the beginning. It has organized and/or participated in many projects and programs related to the restoration of the land at Badger and also collaborative research efforts regarding the intersection of agriculture and conservation. And it honors the “Shared Values” of the Badger Reuse Plan as appropriate within the scope of its research mission.

In addition, the farm contributes to the community by employing about 40 people (most of them Sauk County residents); and it brings more than \$3.5 million to the Sauk Prairie area through employee salaries, hiring local farmers for custom field work, and the purchase of supplies and professional services.



measuring soil gas



barnyard runoff study



air emission chamber



Sauk County dairy breakfast



Manure Tech Expo



Sauk Co. Institute of Leadership