Welcome to the . . .

U.S. Dairy Forage Research Center Farm and University of Wisconsin Ag Research Station

Prairie du Sac
Wisconsin

What is the . . .

U.S. Dairy Forage Research Center

Greener Horizons for Crops, Cows, and Communities

- U.S. Department of Agriculture (USDA)
- Agricultural Research Service (ARS)

Two main locations . . .

Labs, greenhouses, and offices on the UW-Madison campus.

2,006-acre, 350-cow research farm near Prairie du Sac, WI.

Also scientists at:

- St. Paul, MN
- Ithaca, NY
- New unit being formed in Marshfield, WI – *Institute for Environmentally Integrated Dairy Management*

Mission:

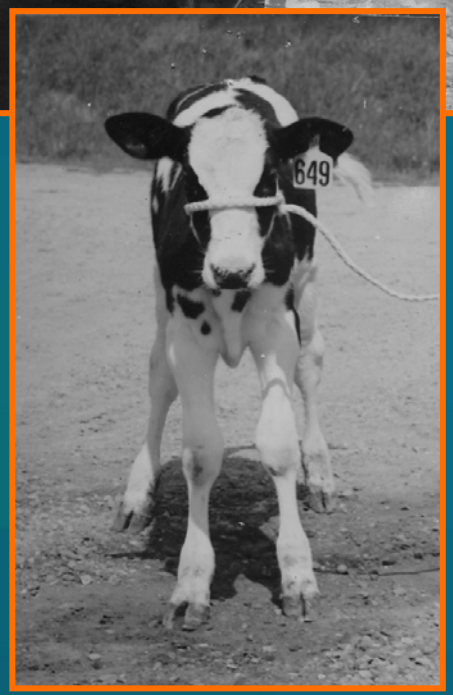
To develop knowledge and tools needed to enhance sustainable and competitive dairy forage systems that . . .

. . . protect the environment,

. . . promote
animal health,

. . . and ensure a safe,
healthy food supply.
WISCONSIN
WISCONSIN STATE BRAND 582
BUTTER
BUTTER

Farm History



- Efforts to establish a USDA dairy research facility date back to the late 1950s.
- 1974-1979: Planning and appropriations.
- 1980: Construction of buildings and feed storage units.
- 1980: First animals brought to farm.

Farm History:

The Herd and UW Connection

- The Farm operates jointly with the University of Wisconsin-Madison College of Agricultural & Life Sciences, Agricultural Research Stations.

THE UNIVERSITY of WISCONSIN MADISON

Farm History:

The Herd and UW Connection

- UW-Madison provided the foundation herd and uses revenues from the farm to offset operating costs and to pay the state employees who work at the farm.

Farm History:
The Herd and UW Connection

- The dairy herd and farm are also available for research by the UW-Madison College of Agricultural and Life Sciences.

Farm History:

The Land and BAAP Connection

- The Farm is on land that was previously owned by the U.S. Dept. of Defense's Badger Army Ammunition Plant.

Farm History:

The Land and BAAP Connection

- The BAAP was built in 1942 to make gun powder for World War II.
- It was used intermittently over a 33-year period during WWII, the Korean War, and the Vietnam War.
- It was put on standby status in 1976.

Farm History:

The Land and BAAP Connection

- In 1980, the USDFRC obtained a special permit through the U.S. Dept. of Defense to farm, at no cost, about 1,500 acres of cropland and pastureland that were part of the BAAP.

Farm History:
The Land and BAAP Connection

- In 1999, the USDFRC began to make lease payments for the use of the land.
- On September 29, 2004, the USDA received custody of 1,943 acres of the BAAP to be used by the USDFRC Farm.

Farm History:
The Land and BAAP Connection

- The USDA was the first to receive land from the 7,354-acre BAAP.
- Subsequent transfers are anticipated to be made to the Bureau of Indian Affairs on behalf of the Ho Chunk Nation and to the National Park Service on behalf of the Wisconsin Department of Natural Resources.

Farm History:

The Land and BAAP Connection

- On August 6, 2005, the USDFRC invited Sauk County neighbors to the farm to celebrate the successful land transfer.

Farm statistics

2,006 acres total

- 531 acres corn for grain and silage
- 340 acres alfalfa
- 320 acres soybeans
- 235 acres pasture
- 90 acres winter wheat
- 40 acres in small research plots
- 450 acres in buildings, roads, and woodlands

Farm Statistics

Farm Statistics

Milk production, 2x

Rolling herd avg.

- 25,378 lbs. milk
- 3.6% fat
- 3.0% protein
- SCC about 350,000

(March 2006)

Facilities

Cow barns

- D Barn – 72-cow tie-stall barn + 14 maternity pens
- E Barn – 72-cow tie-stall barn + 16 stalls in ammonia trial chambers

Facilities

Cow barns

- F Barn – 192-cow free-stall barn;
  (4 groups of 48 cows or 8 groups of 24 cows)
- K4 Barn – 48-stall, sand bedded, dry-cow barn

Facilities

Heifer housing

- 54 calf hutches; move calves out at 8 weeks
- H Barn for heifers from 2 to 4-5 months (48 free stalls, 6 groups of 8 heifers)

Facilities

Heifer housing

- G Barn – 192-head free-stall barn for heifers from 4-5 months until confirmed pregnant; (8 groups of 24 or 16 groups of 12)
- Pregnant heifers on pasture (summer) or on 80-head bedded pack in K3 Barn (winter).

Facilities

Milking parlor

- Double-8 herringbone
- Automatic take-offs
- Individual milk weights
- Crowd gate

Facilities

Feed storage:

- 4 bottom-unloading, oxygen-limiting, glass-lined silos @ 14’ X 50’
- 4 stave silos @ 14’ X 55’
- 2 stave silos @ 24’ X 70’
- 1 bottom-unloading, oxygen-limiting, concrete silo @ 24’ X 78’

Facilities

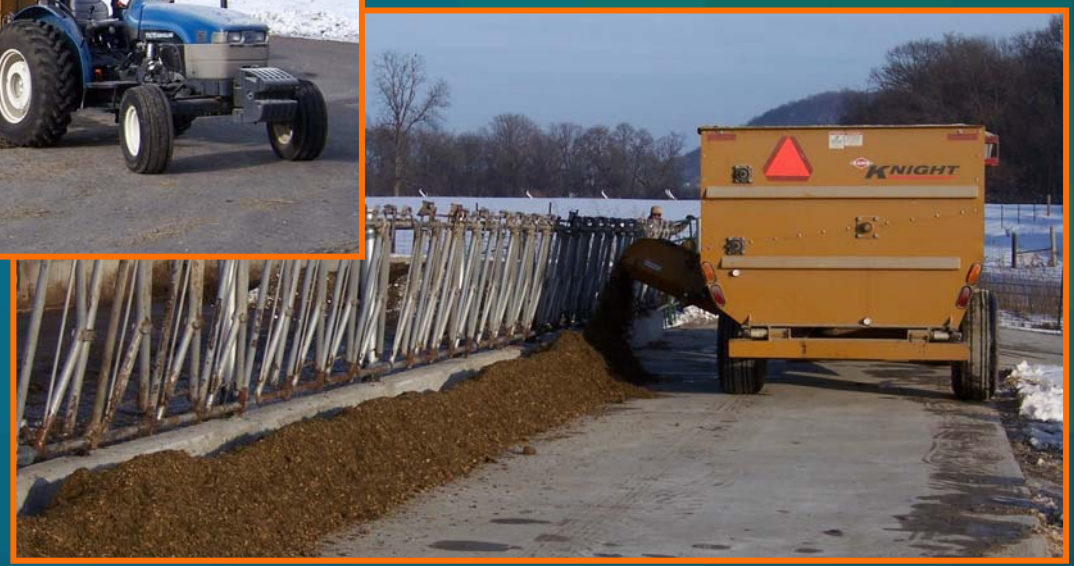
Feed Storage

- 3 bunker silos @ 16’ X 72’ (sized for research)
- 2 bunker silos @ 32’ X 124’
- 1 bunker silo @ 28’ X 96’ (one side) and 124’ (other side)
- Several silo bags in various locations
- 3 large grain bins, several smaller bins

Facilities

Feeding Equipment

- TMR wagon for regular herd feeding



Facilities

Feeding Equipment

- Several Rissler TMR carts to mix and deliver research diets to selected cows.

Facilities

Feeding Equipment

- Mixing station to make base diet before adding different materials for various research projects
- Several small bins for various feed ingredients

Staff

Managers:

- Rick Walgenbach, Farm Manager and Research Agronomist
- Jill Davidson, Herd Manager
- Mike Peters, Assistant Herd Manager

Field Staff:

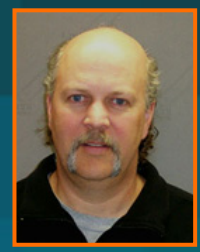
- Ag Project Supervisor
- Automotive Mechanic
- 4 Farm Equipment Operators

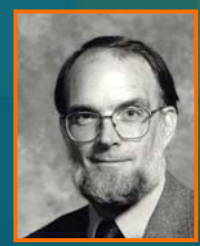
Barn Staff:

- 13 Animal Research Technicians (ART) –milking, feeding, some sampling for research
- 4 ARTs, Advanced (above responsibilities plus herd health and breeding)
- 1 Barn Maintenance Mechanic

Our team includes . . .

- Five dairy scientists
- Three agronomists
- Two ag engineers
- Two plant geneticists
- Two plant physiologists
- Three soil scientists
- One chemist
- Two microbiologists
- One dairy systems specialist





Types of Research

Agronomy:

- Field studies – cropping systems, pasture quality, etc.
- Genetic studies – developing species and cultivars, genetic engineering for improved plants, etc.

Types of Research

Dairy Nutrition:

- Rumen fermentation trials
- Digestion trials
- Feeding trials
- Scientists are studying
  - protein
  - carbohydrates and fiber
  - non-fibrous carbohydrates
  - rumen microbes

Types of Research

Engineering:

- Harvest methods and equipment
- Feed storage methods and facilities

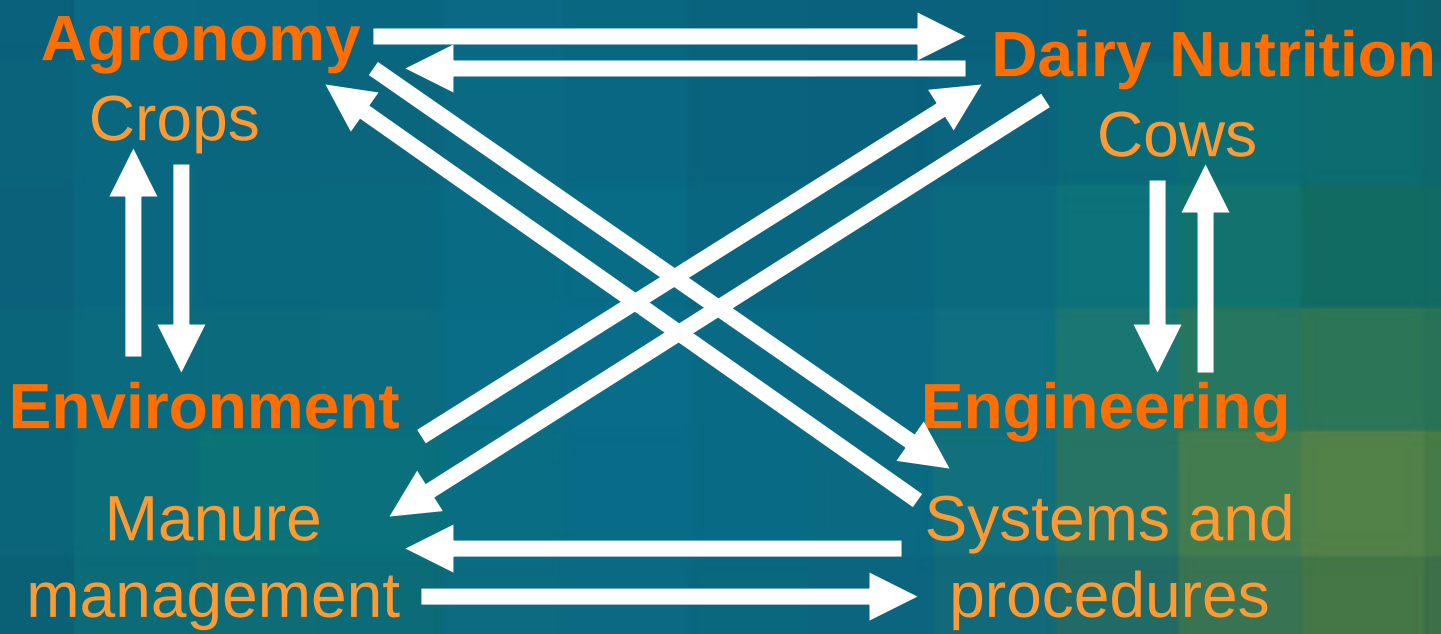
Types of Research

Environment:

- Nutrient cycling
- Manure management
- Ammonia emissions

Types of Research

And how they're all integrated:



Research Procedures and Capabilities

20 rumen cannulated cows allow us to easily collect rumen contents or infuse ingredients into the rumen for various fermentation, digestibility, and feeding trials.

Research Procedures and Capabilities

Milk, crop, feed, and soil samples and measurements are taken frequently.

Research Procedures and Capabilities

Small field plots allow scientists to conduct plant breeding and cropping system research on a small scale.

An example of a field study

Purpose of study:

- To develop methods of sampling fresh forage to mimic what grazing cows consume and digest; samples needed for fermentation trials.

An example of a field study

Trial conducted by:

- Mary Beth Hall
  research dairy scientist
- Geoff Brink
  research agronomist
- An example of multi-disciplinary approach at U.S. Dairy Forage Research Center.

An example of a field study

- Measure crop in field before cutting.

- Hand-cut to mimic a cow grazing.

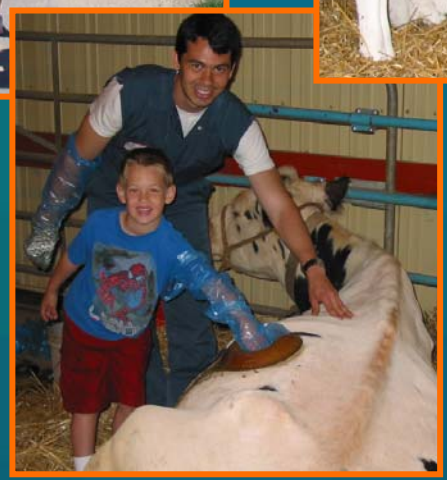
An example of a field study

- Immediately put grass in vacuum-sealed bag to extrude all air that could cause the grass to degrade before getting it to the laboratory.

An example of a field study

- Put into ice chests between layers of dry ice to freeze them immediately so they’re as close to fresh forage as possible when they reach the laboratory.

An example of a field study

- In the lab, see if fresh forage samples give the same results as dried forage samples (type usually used).
- Results will tell how to run experiments and how to handle samples to best reflect what the cow eats on pasture.

Thank you for visiting the U.S. Dairy Forage Research Center Farm