# 2009 Farm Tech Days Tour Script

## Crave Brothers Farm – Waterloo. Wisconsin

## July 21-23, 2009

**Welcome**

Welcome to Wisconsin Farm Technology Days and on behalf of the Crave family and the 20+ staff at Crave Brothers Farm, thank you for joining us on today's tour. Today you will get to see the inner workings of a modern Midwestern dairy farm. In total, this farm is home to 1700 head of cattle and 1700 acres of cropland on which corn, alfalfa, soybeans, and pastures are grown. Please remember to stay in the tram at all times. This is for your safety as well as the farms. The farm is a biosecure facility so limiting potential disease introduction is a major priority of the farm.

**Family Background**

As we get started with the tour, let me first give you a little background on how the four Crave brothers Charlie, George, Tom, and Mark got started and evolved into the operation you will see today.

The Crave brothers were raised on a 40 cow dairy farm near Beloit. In 1978, Charlie and George started farming with partner and UW Professor David Wieckert after graduating from the UW-Madison Farm and Industry Short Course, renting a farm near Mount Horeb and buying 70 cows and young stock. Tom, also a short course graduate, joined the partnership in 1980, and the brothers bought the farmstead here today. Mark joined the farm operation in 1988 after earning his bachelor's degree at UW-Madison. Over time many of the Crave family members have worked on the farm, truly making this a family farm.

**Cheese Plant**

One of the most popular parts of the Crave Brothers farm is the cheese facility. Crave Brothers Farmstead Cheese opened in 2002 with a 6000 square foot facility. In seven years the factory went through two expansions and has grown to the current size of 25,000 square feet. Today, 45 employees convert 100,000 pounds of milk per day into 12,000 pounds of delicious farmstead cheese.

Milk is pumped five days a week from the dairy farm to the cheese plant 320 feet under the road. It is pasteurized and crafted into specialty cheeses. Employees handcraft the cheeses right on the farm in Waterloo, WI using only the freshest, high quality milk from the dairy. This makes the cheese truly farmstead.

Several different and equally tasty cheeses are produced at this facility. Cheeses produced include Fresh Mozzarella, a delicate soft milky cheese ideal for salads or the Crave burger in tent city which includes a beef patty, marinara sauce, and mozzarella cheese; the Farmer's Rope String cheese and Oaxaca, are both variations of mozzarella and form little strings when pulled apart. Also crafted is Mascarpone, a soft Italian dessert cheese,

and the signature cheese of Crave Brothers Farmstead Cheese: a French style cheese called Les Frères and Petit Frère, both ideal to be served with bread and dried fruits.

Each of these cheeses has won awards in state, national and international competitions.

Cheese is packed into 8 oz, 12 oz and 3 pound packages and stored in boxes and shipped on pallets that weigh up to 1600 pounds. That means that Crave Brothers Farmstead Cheese makes up to 18,000 individual packages of cheese each day, five days a week. Weekend milk from the dairy is stored or sold depending on orders.

The cheese produced at this facility is shipped coast to coast, from Seattle, Washington to Atlanta, Georgia, Miami, Florida, to Chicago, Illinois and also to New York City.

Although we will not be able to enter the cheese facility today, there are several opportunities around tent city to see the cheese making process. Visit the Family Living Tent in tent city to see an in-depth video on cheese production at Crave Brothers Farmstead Cheese. Cheese will also be available for purchase at 3 exit locations, North Gate, Gate A, and Gate C.

**Milking Parlor**

Here on your right is the milking parlor, where the Crave's 950 cow herd is milked 3 times each day. With clean-up time, each milking takes 7 to 8 hours to complete, which means that milking is literally a 24/7 job, 365 days/year on the Crave farm. The milking parlor is what is called a "double 16 herringbone", which means that 16 cows are entering and being prepped for milking while the 16 cows on the opposite side of the barn are being milked.

10,000 gallons of milk are harvested and cooled in this barn each day. As the milk is harvested, it flows through a cooler that utilizes fresh water to lower the temperature by more than 40 degrees, and within two minutes, is cooled to 37 degrees F. The tempered water does not go to waste though as it is used in the tanks to water the thirsty animals. The milk is then stored in the tall white tank and daily is pumped via underground pipes over to the cheese factory, where today's milk makes tomorrow's cheese.

Each Crave cow produces on average 11 gallons of milk per day or approximately 180 glasses of milk per cow per day. In the course of a week, the cows on this farm produce the equivalent of 12 semi tanker loads of milk. There is enough milk produced in one day on this farm to provide nearly 56,000 people with their dairy nutritional needs according to food pyramid guidelines.

**Barn A**

This barn on your right is the oldest of the three milk cow barns on the Crave farm. Built in 1990, this was one of the first open air and curtain sided barns in Wisconsin. This type of barn is now commonplace on farms throughout the Midwest. A major advantage of this type of barn is the ability to provide the cows with fresh Wisconsin air, while

sheltering cows from our frigid winter weather as well as relief from the summer heat and sun. These comfortable conditions are achievable because of the side curtains that raise and lower depending on the season.

**Barn C**

On a dairy farm "every day is Mother's Day". Knowing that cows produce more milk when they are comfortable and well fed, the Craves invest in providing five star care for their herd. As we drive through one of the newest barns on the farm, notice all of the cow comfort features which are in place.

First, you'll likely notice how cool and fresh it is in the barn. During these hot summer months, fans and sprinklers provide the ideal conditions for cows.

Secondly, these mothers have an all-you-can-eat buffet laid out 24/7. To aid in milk production, the cows are fed a balanced, nutritious diet. Feed components are weighed and mixed to ensure the cows receive proper nutrition for their size, age and milk production.

Diet is a mixture of homegrown corn silage (which is the entire corn plant chopped up into ¾" pieces) and alfalfa haylage, mixed with purchased grains such as brewers grain, distillers grains, corn gluten feed. These purchased grains are bi-products (or leftovers) from other production processes such as ethanol, corn sweeteners and beer. Being ruminants, cows are able to digest nutrients from these feeds, which might otherwise go to waste.

While she doesn't actually get breakfast in bed, the buffet line is not very far away, 24 hours/day. After a trip through the buffet, these moms enjoy fresh Wisconsin water before lounging in their comfortable beds, which are groomed by staff 3 x/day.

The bedding that the cows are lying in is a recycled byproduct collected back from the manure digester. Note how clean these cows rest in their freshly bedded stalls. Ask any mom how she'd like to spend Mother's Day, and she'll likely ask for a good meal, refreshing drink and plenty of relaxation. When not being milked, that's exactly how the Crave cows spend their time. Returning to the feed buffet time and time again, a cow eats up to 130 pounds of feed daily. And that's good news for the farm; because the more a cow eats, the more milk she produces.

One last feature of this barn to note are the slotted floors which allow manure to pass freely through. Gravity flow moves the fresh manure to a pit, where it is eventually pumped over to the manure digester.

**Manure Digester**

On the right is the manure digester facility. It is owned and operated by the Milwaukee firm Clear Horizons. It is a combination of equipment that creates renewable energy, bedding for the farm, and a potting mix called Energro. Every day 50,000 gallons of

manure from the cows and heifers and 5,000 gallons of whey from the cheese factory are processed in the digester.

The manure and whey is pumped daily into the two 750,000 gallon insulated tanks, which are the digesters. The manure and whey is heated to 100 degrees F, and mixed with four mixers inside of the tank. There are natural bacteria in manure that thrive in these conditions. The bacteria break down the organic food left in the manure and create biogas as part of the process. The digester does not destroy the manure, it breaks it down into gas and other nutrient stable by products that are much easier for the farm to use.

Biogas is mainly methane, which is the same as the natural gas you burn in your stove at home. The gas is captured in the flexible green roof. Methane is also a green house gas, so by capturing it we are helping to protect the environment.

All of the biogas produced is contained inside of the green roof or in pipes so it is very safe. The gas is then pumped into a combustion engine, just like the one in a car, except it is much bigger. The engine is located inside the room with all the piping on the top of it. That engine uses the biogas as fuel to operate. As the engine runs it turns a generator, creating electricity. The electricity travels underground to the power lines you see in front of us, which are supply power to utilities customers.

This digester produces enough electricity to power 550 average Wisconsin homes. That is much more electricity than the farm or cheese factory use. It would take over 1,000 gallons of diesel fuel every day to make the same amount of power. And unlike wind or solar power that are only able to operate certain parts of the day, as long as the farm has manure our engine is able to run. It runs 24 hours per day, often for weeks at a time without shutting down.

As you can imagine, a big engine can get very hot. The heat is captured to heat the digesters to 100 degrees and also provide heat for the farms shop, office building in the winter as well as heating water throughout the farm.

After manure has been in the digester tanks for about 25 days it is removed and squeezed to separated the nutrient rich water from the solid fiber. The liquid portion gravity flows to the farms 10.5 million gallon concrete lagoon where it is stored for application to the growing alfalfa after cutting or after harvesting corn and soybeans in the fall. The manure supplies nearly all of the nutrients growing crops need. The farm works closely with agronomists to make sure each crop gets the nutrients required for a healthy plant, while maintaining the soil and protecting local wildlife and waterways.

The fiber separated from the digested manure is conveyed overhead and stored in this shed where it is used either for bedding on the farm or sold to the horticultural industry as a potting mix called Energro. Almost 1 semi of fiber is produced every day. For those interested in purchasing Energro, it is available at Neitzel's hardware store in Waterloo.

The rooms to the right contain the computer controls and pumping equipment. Because the plant functions 24 hours per day, it can't always be monitored by a person. The computer does most of the work. If a problem occurs an alarm is sent to the cell phones of the Clear Horizons operators, who can then respond.

The digester is another tool for the farm to maximize their efficiency while creating renewable energy, bedding for the cows, potting soil mixes, heat for their buildings, all while protecting the environment.

**Dry Cow Barn**

As we proceed, the barn on your left is the dry cow barn, what you might think of as an all inclusive vacation resort for cattle. If you are wondering what a dry cow is, let me explain some terminology.

When a baby bovine is born it is either a female which is called a heifer calf or male which is called a bull calf. The bull calves are sold to a local beef producer while the heifer calves are kept on the farm so they can grow and eventually become part of the milking herd. Both bulls and heifers are called calves until 1 year of age. A heifer is an adolescent female. Heifers grow about 2#/day for the first two years of their life and typically get pregnant at about 15 months of age. Her gestation is slightly over 9 months and which means she typically has her first calf close to her 2$^{nd}$ birthday.

After having a calf, each cow lactates for roughly 10 months, visiting the milking parlor 3 times per day. Dairy cows get pregnant again while they are still milking, which is not the case with most other livestock species. Roughly 2 months before she is due to have her next calf, the cow is "dried off" or- in layman's terms – no longer milked. She is moved to this barn – the all-inclusive vacation barn, where she rests to reset her biological system and prepares to be a mother again.

Animals in the dry cow barn are monitored around the clock by trained staff for signs of labor and any other special needs. At first signs of labor, the cows are moved to a comfortable birthing pen in the adjacent barn where it is quiet, cool and comfortable. On average, 3 calves are born each day on the Crave farm year round.

**Barn E**

After birth, the heifer calves are raised in a nursery until they are 2 months old. At that time, calves are moved into this barn, which is the first of 4 heifer barns we'll see. Cattle are housed with herdmates their own age and size, much like school children These calves mature quickly, so every few months they have a "graduation day" and move to the next barn, which better meets their changing feed and size needs. Again, note these calves have plenty of fresh air year round. As with the cows, their manure is collected and processed through the digester.

**Pen 28**
In this pen, the adolescent heifers are artificially inseminated when they are about 15 months old. Artificial Insemination has been commonplace on dairy farms for almost 50 years. In fact, much of the human reproduction technology was initiated based on leanings from working with livestock.

The Artificial Insemination is performed by specialty trained farm staff. Five weeks after insemination, the veterinarian examines each animal with ultrasound to determine whether or not she is pregnant. If pregnant, she spends the next 7 months of gestation in the gestating barn, where she is fed a balanced diet and has access to pasture so she gets plenty of exercise. The vet reexamines the animal again one month later. At this time, the gender of the calf can already be identified.

One month prior to her due date, each animal graduates to the for mentioned dry cow barn. Along with nutrition and comfort needs, each expectant mom is vaccinated to ensure good health for herself and her baby.

**Bunker Silos**
On your right as we round the corner is the feed center. This is where feeds harvested during the growing season are stored. The long cement structures are called bunker silos. Much like the tower silos that dot the Wisconsin country side, plant material is packed into these silos and fermented, which is how they are preserved for year round use. At harvest time, a tractor levels the feed in the bunker silo. As it drives on the feed, it compresses the air out of the pile, which allows for anaerobic - or oxygen free - fermentation.

The 10 bunker silos hold over 34,000 tons of feed which is equivalent to 53 traditional tower silos. It sounds like a lot, but every twelve months these silos are emptied and filled again to help provide the feed that is fed to the Crave herd daily.

The Craves grow about half of the needed feed for the herd here on farm. The other half are purchased and handled in these 3 galvanized bins. Livestock feed consumes nearly half of all the corn, and soybeans grown in the United States providing other farmers with a stable customer base.

At each feeding, silages from the silo and commodities from the bin are mixed on a computerized mixing truck. Whey, a byproduct from the cheese factory, is piped underground and blended in this mix to further enhance nutrients and feed moisture. This makes what is called a Total Mixed Ration. Seventeen loads of feed are mixed daily totaling nearly 90 tons.

**Out Driveway**
As we proceed back to tent city, you'll notice the farm shop and office on the right. Both buildings are heated in winter with surplus heat generated from the manure digester system.

**Original Barn**
On your left, you'll see one of the only two remaining original barns that existed when the Craves purchased the farm in 1981. Ninety two cows were housed and milked in this barn until 1990, when the first of many farm expansions occurred. This barn now serves a key role as the nursery, providing a warm, comfortable home for each calf. In this barn for the first two months of life, the calves are fed pasteurized milk twice daily. By the time she is 2 months old, the calf is consuming almost 2 gallons of milk each day.

**Conclusion**
As we continue back to tent city, I just want to point out a couple of locations in tent city that have more information on the Crave Brothers farm, family and a more detailed explanation of the cheese making process. The family living tent and Dodge County tent both have assorted videos covering cheese making and farm operations. Additionally, the family living tent will have pictures of the Crave family and farm throughout the years as they have grown from a small family farm near Beloit to a little bit larger family and farm near Waterloo. For any additional information on Dodge County Farm Technology Days or questions, visit www.dodgecountyfarmtech.com.

Thank you for taking a tour of the Crave Brothers farm. We hope that we have provided a good overview of the farm and cheese plant. Enjoy the rest of your time at Dodge County Farm Technology Days.