

## 2014 Maine Farm Days Conservation Tour, Misty Meadows Farm, Clinton, ME

**Welcome to Maine Farm Days, a unique 2-day event held every year on a working dairy farm in central Maine since 1972.**

This year's event is hosted by Misty Meadows Farm in Clinton, Maine.

Misty Meadows is owned and operated by John and Belinda Stoughton, Belinda's son TJ and his wife Kim Wright.

My name is \_\_\_\_\_ I work for the Natural Resources Conservation Service, a part of the U.S. Department of Agriculture. We are a federal agency that works with landowners to conserve natural resources, reduce soil erosion, protect and improve water quality and address other resource concerns on private land. We provide both technical and financial assistance at the request of participants to address their particular resource issues.

**Dairy farms in Clinton produce more milk than any other town in Maine**, totaling 13% of the entire State. The 7 dairy farms operating in Clinton manage over 5,900 cows and grow feed on more than 9,300 acres of land.

There are more cows in Clinton than people.

Maine has 300 dairy farms producing around 600 Million pounds (that's 70 million gallons) of milk per year.

### 1

**Bunker Silo** - On your left you will see the Bunker Silo. This 200 foot by 400 foot asphalt pad holds the harvest of 500 acres of corn and over 550 acres of grass, clover and alfalfa. This cow feed is harvested, trucked and stored here to provide year-round food for the dairy herd.

**Show the containers of silage and grain, offer to pass them around. Holes in the top so they can smell.**

These are the three main components of a milking cow's diet.

This is **corn silage**- an entire corn plant chopped up and naturally fermented in the silo, providing fiber and energy to the cows.

This is **grass silage** that is harvested multiple times throughout the summer, also fermented, providing fiber and protein.

These two ingredients are typically mixed in a 1 : 1 ratio. **A dairy cow eats about 110 pounds of this locally harvested mix every day.**

The last component is a purchased mixture of dry corn, grains and soy. It provides protein and energy to a high production lactating cow, which will eat 25 pounds of this a day.

**Herd Production** - Misty Meadows Farm works hard to improve herd production by carefully managing herd health, animal comfort and nutrition.

The farm averages 79 pounds of milk (**over 9 gallons**) **per cow per day.**  
The farm ships around 40,000 pounds (over 4600 gallons) of milk to Oakhurst Dairy every day.

A key indicator of production on dairy farms is the dry matter intake conversion. The milking industry encourages producers to be within the 1.4 to 1.5 range. This means that for every pound of food a cow eats they give 1.4 to 1.5 pounds of milk. This farm exceeds that amount, producing 1.6 pounds of milk for every pound of feed.

Milk quality is very important to Misty Meadows Farm.

The Somatic Cell Count of white blood cells is a key indicator of milk quality and animal health, where any count under 200,000 is considered very good. The count on this farm is 120,000, an indication of successful management of herd health.

## 2

**Barnyard.** We are now approaching the barnyard where Misty Meadows **600 dairy cows** are housed in four free stall barns.

Free stall barns allow animals to wander around freely to access feed and water as well as rest in a sand-bedded stall whenever they want to.

The farm uses about 46 cubic yards of sand every week to keep stalls clean and comfortable for the cows. **The more comfortable the cows are, the more milk they will produce.**

Milking cows are separated into three groups, high production, low production and first calf heifers. Each group is housed in a different barn and gets a different feed ration.

**Enter New Barn**

This is a new barn constructed by the Stoughton's two year's ago. It measures 110 feet wide by 280 feet long and houses about 300 cows. It is a free stall barn designed for cow comfort.

We are now travelling down the feed alley. This is where feed is deposited twice a day. On both sides of the barn are the raised free stalls and scrape alleys, where the cows deposit most of their manure. Note the high ceilings, large fans and cool temperatures. Ventilation is crucial to proper cow health and comfort.

The alley on your right leads to the milking parlor. Cows are milked three times each day in a double 12 herring bone parlor. **Each milking takes about six hours.** Milking three times a day increases production by about 10%.

The area in the south east corner of the barn with sawdust bedding is the nursery and hospital. This is where cows give birth or are housed for medical attention.

### **Exit Barn**

The small barn on our right is the Bull facility. **The Stoughton's use 8 healthy bulls to service the herd.**

You can take a self guided tour through the barnyard after the tour. The milking parlor will not be open if the cows are being milked. **Please do not pet the heifers.** They are very cute, but also very young and very susceptible to diseases just like human children.

A few other words of warning: please do not open a gate or door if it is not already open. And do not touch any wires as they may be electrified!

**Young Stock facility (This cannot be seen from the tour.)** - Up the road just past the bunker silo is the young-stock facility where up to 475 young animals are raised. The Stoughton's raise all of their own heifers.

Newborn heifer calves are raised initially in a calf barn where temperatures and environment can be precisely controlled. They are bedded on kiln dried bagged shavings. They graduate to individual outdoor calf hutches and then to group housing.

There is a manure storage at that facility that was built in 2007. The storage is 200' x 80' with 10' high precast concrete walls.

The manure is handled as a semi-solid, pushed out of the barn onto a loading pad then into the storage.

NRCS designed the structure, oversaw construction and provided financial assistance.

# 3

Here we are between the barns and the primary manure storage. Between the barns you can see a low shed-like structure connecting the buildings. Inside this structure is a gutter cleaner that moves all the manure from the three older barns to a manure pump. **This piston pump pushes the manure through an underground pipe to the manure storage.** The pipe comes up in the middle of storage floor.

Manure is agitated and unloaded with a tractor PTO driven pump that pumps the manure into manure spreaders for field application.

90% of the content of liquid manure is water. It also contains many necessary plant nutrients like Nitrogen, Potassium and Phosphorus.

# 4

Managing manure as a nutrient source, rather than a waste product, helps Misty Meadows drastically reduce their fertilizer costs.

**Home Farm Manure Pit** – This manure storage was built in 1998. NRCS designed the structure and provided some financial assistance for its construction.

**The storage is 300 feet by 150 feet (or a little more than one acre in size), with 10 foot high precast concrete walls and a concrete floor that required 700 cubic yards of concrete poured in place to construct.**

It holds over 360,000 cubic feet of manure.

This storage is designed to store manure, waste sand and milkroom waste for 180 days.

Having a manure storage enables the farmer to spread manure during the time of year when nutrients can be used most effectively for growing crops.

The storage has two ramps to allow equipment access to remove solids after the liquids have been pumped out.

**Nutrient Management** - Misty Meadows Farm is able to meet most of their crop nutrient needs by utilizing cow manure to fertilize cropland. NRCS has worked with the farm to develop a Comprehensive Nutrient Management Plan. This identifies spreading setbacks from sensitive areas as well as determining manure application rates based on soil and manure tests and crop needs.

Manure is a valuable resource. It contains necessary nutrients to grow crops. It reduces production costs. It also boosts soil organic matter levels and improves soil quality.

Misty Meadows works hard to manage the nutrients in an environmentally friendly way. For instance, this farm utilizes a reduced phosphorus feed scheme that greatly reduces the amount of phosphorus in the manure that is applied to the land. This decreases the chance of phosphorus getting to water bodies, where it can cause an overabundance of algae and low oxygen conditions for fish and other aquatic species.

## 5

**Soil Quality** – Soil is an ecosystem that is critical for life. It filters our water and grows our food; without it we would not be living. Soil also stores carbon dioxide, provides habitat and sustains biodiversity, controls water quantity and quality, provides raw materials for roads and buildings and preserves our cultural and archaeological heritage.

**Forage quality - Forage Quality is a top goal for Misty Meadows.** Special attention is paid to harvesting all crops at the peak of quality. Their first grass harvest in June averages 12 days from start to completion.

The farm manages **1050 acres of cropland**. With 500 acres in silage corn and 550 acres in grass silage and dry hay. Misty Meadows produces 9600 tons of corn silage and 4000 tons of grass silage each year.

Misty Meadows farm is committed to land stewardship. The farm follows a conservation plan that protects soil and water resources.

Corn & Forage Trials are located to your left. If you are interested you can check them out after the tour. The small signs indicate the different varieties.

## 6

**Corn Maze** - Pine Tree Camp in Rome, Maine is sponsoring the corn maze this year. For a small donation you can give the maze a try. Donations support Pine Tree Camp's programs for children and adults with disabilities.

**Crop Rotation** - Misty Meadows has developed a crop rotation system that typically involves a **5 year corn and 5 year hay rotation**. Rotating crops helps to break insect, disease and weed pest cycles, reduces erosion, improves soil quality and builds soil organic matter levels. Manufactured nitrogen fertilizer is expensive. This crop rotation helps the farm to grow some of their own nitrogen by including legumes in the grass rotation.

**Hayland Planting** - Some of the hay fields have been seeded with Reed Canarygrass as part of the mix. Reed Canarygrass is a high tonnage grass that is well suited to growing on heavier soils.

**Cover Cropping** - **Misty Meadows Farm plants winter rye on corn fields after the corn is harvested.** The winter rye serves as a cover crop to protect soil from washing in the late fall and early spring. It also serves as a green manure crop that can be turned under at planting time to improve soil quality and conserve nutrients for use by the next crop.

**No Till** - Misty Meadows Farm has implemented no till planting of corn on some of their acreage. This process eliminates soil disturbance by directly planting corn into the vegetated residue after an application of herbicide. This practice reduces erosion, improves soil organic matter, and increases available moisture to the plants.

## 7

**Contour Strip Farming** - The fields on your left are planted in contour strips. **These alternating 120 foot strips of tall fescue and corn are laid out on the contour to prevent erosion.** The grass strips are harvested 3 to 4 times each year. These strips provide cover for the soil and prevent runoff from concentrating into a channel. The row direction is aligned on the contour as opposed to up and down the slope, further reducing erosion.

Every 5 years the strips will be rotated so that the corn strip is seeded down to grass and the grass is plowed and planted to corn.

## 8

Note the forested area we are passing on the left which includes a small pond, grasses, shrubs, wild apple trees and woods. This edge habitat, between open fields and woods, is important wildlife habitat for birds, mammals, insects, amphibians and other creatures.

**Agricultural lands throughout Maine provide many public benefits including open space, scenic vistas, a local food supply, wildlife habitats, hunting and other recreational pursuits.**

In addition to their cropland, Misty Meadows Farm also owns 350 acres of woodlands, an important asset to the farm.

**Forestry Stop** - At this point we are approaching the forestry stop to hear a little about woodlot management from a forestry expert. You can get out and hear more if you'd like.

**Tractor stops and someone speaks briefly about Forestry.**

That's the end of our tour folks. I hope that you enjoyed it.

Are there any questions?

Thanks again and I hope you enjoy the rest of the event.

## General Factoids

### Misty Meadow Factoids

1. Misty Meadow Farm has 10 employees in addition to family members.
2. Misty Meadows Farm has a total herd size of 850 cows and milks 530 animals.
3. The farm consists of 900 acres of cropland with 490 acres in corn production and 330 acres for grass silage.
4. Cows are milked three times a day in a double 12 herringbone parlor at 8 hour intervals.
5. Daily milk production is about 38,000 lbs or about 4400 gallons of milk daily. (8.6 gal/lb)
6. On average each cow produces about 87 pounds or 10 gallons daily.
7. Misty Meadows Farm takes about six hours to complete each milking.
8. One cow produces approximately 87 lbs of milk daily (10 gallons).
9. The high production cows average 110 lbs/day. Misty Meadows Farm maintains three milking herds.
10. Cows are bedded with sand. The uses  $\approx$ 46 cubic yards of sand per week.
11. During a busy harvest week in the summer nearly 2000 gallons of diesel fuel is used to operate all the machinery.
12. On average cows are fed 34 tons of feed and grain a day.
13. The farm uses about 16000 gallons of water each day in the care of animals and production of milk. That's 5.8 million gallons in a year.
14. The manure and milk room waste from the milk production is stored in manure storage pits that cover approximately 1 acre. And holds 360,000 cubic feet of waste. Bunker silage leachate is stored on a large asphalt pad. Manure waste from the young stock facility is stored in a 160,000 cubic foot storage pit.
15. Misty Meadows Farm produces 100% of its forage needs.
16. Misty Meadows Farm raises 180 calves every year in order to produce new milk cows. They are raised until they are about 22 months old before they begin being milked.

### Soil Factoids

- Soil makes up the outermost layer of our planet.
- Topsoil is the most productive soil layer.
- Soil has varying amounts of organic matter (living and dead organisms), minerals, and nutrients.
- Five tons of topsoil spread over an acre is only as thick as a dime.
- Natural processes can take more than 500 years to form one inch of topsoil.
- Soil scientists have identified over 70,000 kinds of soil in the United States.
- Soil is formed from rocks and decaying plants and animals.

- An average soil sample is 45 percent minerals, 25 percent water, 25 percent air, and five percent organic matter.
- Different-sized mineral particles, such as sand, silt, and clay, give soil its texture.
- Fungi and bacteria help break down organic matter in the soil.
- Plant roots and lichens break up rocks which become part of new soil.
- Roots loosen the soil, allowing oxygen to penetrate. This benefits animals living in the soil.
- Roots hold soil together and help prevent erosion.
- Five to 10 tons of animal life can live in an acre of soil.
- Earthworms digest organic matter, recycle nutrients, and make the surface soil richer.
- Mice take seeds and other plant materials into underground burrows, where this material eventually decays and becomes part of the soil.
- Mice, moles, and shrews dig burrows which help aerate the soil.

## **Milk & Cow Factoids**

### **History**

- There are about 920 different breeds of cows in the world. They were domesticated about 5,000 years ago
- Cows came to America with the Pilgrims. They arrived in the Jamestown colony in 1611.
- The first regular shipment of milk by railroad was between Orange County, New York, and New York City and began in 1841
- Until the 1850's, nearly every family had its own cow
- The milk bottle was invented in 1884. Plastic milk containers came later – in 1964.
- Before milking machines were invented in 1894, farmers could only milk about 6 cows per hour. Today, farmers use machines to milk more than 100 cows per hour.
- Dairying has improved through the years. Today, one cow can produce the milk that it once took 10 cows to produce

### **Milk/Dairy Industry**

- Holsteins make up 93% of the U.S. dairy cattle (followed by Jerseys with 5.5%)
- Around 9.2 million cows are being milked on 110,000 farms in the U.S.
- More than 99% of all dairy farms are family owned and operated
- 72% of dairy calcium in the U.S. comes from milk and other dairy foods
- One cow produces an average of eight gallons of milk a day, but the best cows can give over 25 gallons of milk each day
- It takes about 350 squirts for each gallon of milk from a cow
- U.S. cows give an average of 2,000 gallons of milk per year. That's over 30,000 glasses of milk!

- The record milk production for a single cow in a year is 55,660 pounds of milk.
- It takes all the milk from 330,000 cows each year to fill the milk needs of Wal-Mart.
- Dairy cows provide 90% of the world's milk supply.
- Any warm-blooded animal such as goats, sheep, horses, reindeer, camels and water buffalo also produce milk
- Milk is a great source of protein which helps build muscle
- Milk also contains 4 necessary minerals: calcium, phosphorus, magnesium and zinc
- The temperature of milk when it leaves the body of a cow is 101 degrees Fahrenheit. The milk is then quickly chilled and stored at a temperature of 40 degrees Fahrenheit
- Studies have shown that classical music helps cows produce more milk
- It takes 21.2 pounds of whole milk to make one pound of butter
- It takes 12 pounds of whole milk to make one gallon of ice cream
- Speaking of ice cream, an average of 48 pints of ice cream per person is consumed each year in the U.S. – more than any other country.

### Cows

- Cattle is the name for the entire "cow" family.
- A cow is a mature female and a bull is an adult male of the bovine family.
- A steer is a castrated male
- A heifer is a young female cow that hasn't had a calf yet.
- A cow can't produce milk until she has had a calf.
- The average cow is 2 years old when she has her first calf.
- Cows are milked for an average of 3-4 years
- Calves are fed milk until they are 8-9 weeks old.
- Cows drink anywhere from 25 to 35 gallons of water each day – equal to a bathtub filled with water and eat about 40 to 50 pounds of feed per day.
- Dairy cows can produce up to 35 gallons of saliva a day.
- Cows are ruminants, which are cud chewing mammals
- Contrary to popular belief, cows do not have 4 stomachs; they have 4 digestive compartments
- Each day a cow spends 6 hours eating and 8 hours chewing her cud (regurgitated, partially digested food).
- A cow weighs about 1,000 to 1,400 pounds.
- A 1,000 pound cow produces an average of 10 tons of manure a year.
- Cows can live 25 years. You can guess the age of a cow that has horns by counting the number of rings on the horns.
- Cows have 32 teeth:
  - 8 incisors on the bottom front
  - 6 molars on the top and bottom of each side

- Cows don't bite because they have no upper front teeth. Instead they have a thick, tough pad of skin on their top jaw. They curl their very large tongue around the grass and feed they eat.
- The average body temperature of a cow is 101.5°F.
- A Holstein's spots are like a fingerprint – no two cows have exactly the same pattern
- Humans and cows have the same gestation period which is about nine months.
- Cows are very social animals. They form large herds and just like people, they will bond to some herd members while avoiding others.
- They "moo" and use different body positions and facial expressions to communicate with each other
- A cow stands up and sits down about 14 times a day.
- Cows can detect odors up to five miles away.
- Cows are able to hear lower and higher frequencies better than humans.
- Cows have almost total 360 degree panoramic vision and are able to see colors, except red.
- When galloping through boggy, soggy places or deep mud, cattle can run faster than horses. They have cloven hooves and their toes spread so their wide feet do not sink as deep as those of the solid-hoofed horse.

## **Cow Jokes**

### **Cow jokes**

Why does a milking stool have only three legs?  
Because the cow has the udder.

What are the spots on black and white cows?  
Holstains

What kind of milk comes from a forgetful cow?  
Milk of Amnesia

Where do cows go when they want a night out?  
To the moo-vies!

What was the bull doing in the pasture with his eyes closed?  
Bull-doizin'

Do you know why the cow jumped over the moon?  
The farmer had cold hands

What did the bored cow say when she got up in the morning?  
"It's just an udder day"

How does a farmer count a herd of cows?  
With a Cowculator

Why don't cows have any money?  
Because farmers milk them dry

Where do Russians get their milk?  
From Mos-cows

What's a cow's favorite moosical note?  
Beef-flat

What do cows wear in Hawaii?  
Moo- moos

What do you call a cow that has just had a calf?  
Decalfenated

Why did the cow wear a bell around her neck?  
Because her horn didn't work

Did you hear that NASA recently launched a bunch of Holsteins into low Earth orbit?  
They called it the Herd Shot 'Round The World!

What did the cow say when she saw her calf's messy room?  
Were you raised in a barn?

A farmer was milking a cow one day when he noticed a fly go in the cow's ear. After he was done with the milking, he saw the same fly in the milk. Then he said, "That's funny. It went in one ear and out the udder!"

There are 2 cows in a field, one cow looks at the other cow and says "moo." The other cow looks back and says "I was just going to say that"

# 2013 MAINE FARM DAYS CONSERVATION TOUR

