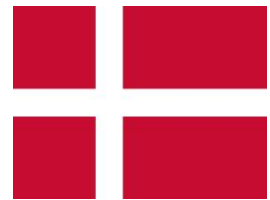


Progressive Dairy Operators

# Study Tour to Sweden and Denmark



August 15<sup>th</sup> to 28<sup>th</sup>, 2014



PROGRESSIVE DAIRY OPERATORS  
[www.pdo-ontario.ca](http://www.pdo-ontario.ca)

Compiled by: Harold House, OMAFRA

Many thanks to the contributions by Laura Martin, Kenpal

and by Jack Rodenburg. Dairylogix

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## Introduction

The Progressive Dairy Operators of Ontario organized a tour to Sweden and Denmark to study the Swedish and Danish dairy industries from August 15<sup>th</sup> to 28<sup>th</sup>, 2014. The group consisted of 60 participants from British Columbia, Saskatchewan, Ontario, Wisconsin, and Dubai.



The group visited seven farms in Sweden including the DeLaval research farm at Hamra, and nine farms in Denmark including the Foulum research facility at Tjele.

The group also learned about Swedish history while spending time in Stockholm, as well as making the most of historic sites while staying overnight in cities like Orebro and Kalmar. The time spent in Copenhagen was also fascinating, and the history of Vikings was further expanded by a visit to the Viking Museum in Roskilde.

39 members of the group stayed over two days in Iceland on the return trip. This was just enough to see a few of the major sites, and to create a desire to return some day and see more.

## **Automation**

The group quickly learned that the Swedish and Danish dairy industries are influenced in both countries by labour laws and animal welfare regulations. The current labour situation has led to the adoption of far more automation than what we are currently seeing in North America. The group saw robotic milking systems from four different milking equipment companies including a rotary parlour where the cows were milked robotically. The group also saw several different styles of robotic and automated feeding systems which are not at all common in North America. Two styles of automated bedding systems were also observed as well as robotic slat scrapers. Money was invested in automation instead of labour.



**Robotic feeding robot**

Both the labour laws and animal welfare regulations resulted in increased paperwork for producers. Events must be recorded to show they are meeting the regulations. One producer mentioned the stress of not knowing when an inspector might show up to audit their operation.



**Pasture legislation requires that cows are on pasture for specified time periods**

## **Cow Welfare**

Legislated cow welfare was another factor the group learned was influencing the dairy industry in Sweden and Denmark. Providing cow comfort through proper use of bedding, and stall design is a goal for every dairy producer, but what the group saw was the result of perception by the public of how they think cows want to behave. This resulted in pasture legislation, although sounding good was not always cow friendly.

It was a good lesson for the group, and resulted in ideas to have better consumer relations, and to be more proactive in

showing the public and politicians the effort producers take to provide comfort and welfare for their cows.

### **Consumer Relations**

Several of the farms visited by the group were promoting on-farm sales and visits by the consumers. This ranged from farms that processed their own milk and had a dairy and meat retail store to a farm that had a coin operated milk dispenser. At both these farms the public were encouraged to visit and view the barns and see the cows “at work”. Several farms were also producing “organic” milk to meet consumer demand.

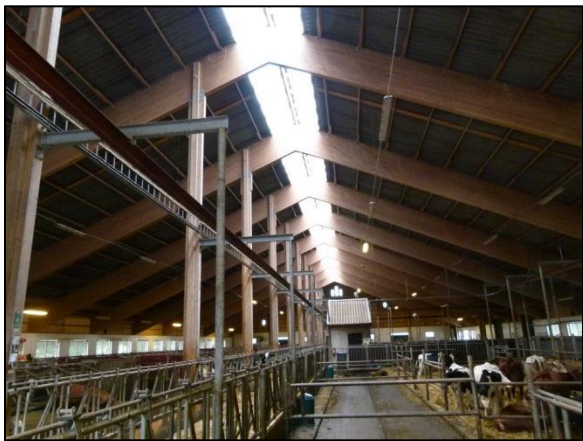


**Coin operated milk dispenser**

### **Quota Changes**

The European Union will discontinue their quota system next April resulting in major changes to the European dairy system. Most producers the group visited had plans to milk more cows. If every producer milks more cows it is easy to predict what will happen to the milk price. The group also learned the effect of living next door to a large neighbour like Russia, and the impact on milk prices when import/export policies change overnight.

### **Dairy Cow Housing**



**Laminated wood beam construction**

The style of barns were similar to what is common in Ontario, although the availability of lumber resulted in more barns constructed with laminated wood beams and other wooden members. Steel framing was also common to provide larger clear spans. Natural ventilation was also common, although some barns had partial solid walls with adjustable panels instead of full curtain walls. A couple of barns included outside feeding systems.

The group was also treated to a variety of “heritage” barns. Some barns on the farmsteads dated back more than 200 years and were still in use. Some of the homes were also unique in this fact as well.

### **Manure Management**

The intensity of agriculture in Europe and particularly Denmark has resulted in nutrient management legislation that was enacted before similar legislation in Ontario, but there are also more restrictions.

The group saw a variety of covered manure storages, and other approaches to reduce the emission of methane gas and ammonia. Anaerobic digestion was used to process manure. The group also saw systems to acidify manure to reduce ammonia. Some different manure collection systems were used, again to reduce emissions.



**Acidification of manure to reduce ammonia emissions**

The solids from manure were commonly separated and used for bedding for the dairy cows. On a couple of the farms the separated solids were applied to the stalls with automatic delivery systems.

### **Summary**

Dairy farms are similar everywhere, but the group saw more automation than what they experience at home, and the influence of legislation. This resulted in greater efficiencies in some cases, but more bureaucracy and paper work in others.

### **Feeding Cows in Scandinavia**

Laura Martin, M.Sc

The Progressive Dairy Operators had the opportunity to go on a study tour of Sweden and Denmark in August this year. A group of 60 people travelled these countries and learned a lot of information about producing milk in Scandinavia. Being a nutritionist I was most interested in how they feed their cows. With climate differences, commodity costs in the EU, and strict regulations, the Swedes and Danes have to get creative when it comes to feeding dairy cows.

While much of Scandinavia is in the Arctic Circle, unsuitable for intensive farming, Denmark and the southern regions of Sweden enjoy quite mild summers due to the Gulf Stream. Forecasters have predicted that the disappearance of quota in the EU next April will drive milk production to north Europe, creating a new “milk belt” that includes Denmark and Southern Sweden. While the weather is temperate enough for farming, the summers are often wet with average temperatures around 20°C. This makes it difficult to grow heat loving feeds like corn.

For the first few days touring around Sweden corn fields were few and far between. Most fields were small grains (wheat, barley, and oats), fava beans and rapeseed. As the tour went further south corn fields were more prevalent, and by Denmark it started to look more like South Western Ontario, with field after field of corn or beans. The corn there was quite different from corn in Ontario though. It could be climate related or it may be that GMO corn cannot be grown in Sweden or Denmark, but the corn was much shorter

with a very thin stalk, and looked to yield much less silage per acre than what Ontario farmers can expect.

When on farms it was my mission to discover how they fed their cows. With very little corn in the fields I was curious as to what they feed their milk cows for energy. Whole crop silage is the answer. A field is planted with small grains and under-seeded with grass. The first year the whole crop is harvested and ensiled creating a higher energy, high yielding feed. For the next two years the grass crop is harvested off the field and after the second year it is plowed down, so the whole process can repeat again. Staggering the planting of the fields ensures a steady harvest of whole crop silage. In Denmark, where corn is more widely grown, corn silage is harvested and used as a high energy forage, similar to Ontario.

Most farms do not feed corn to the milk cows. Small grains, mostly wheat or barley, were used as concentrated sources of energy. Corn grain is very expensive and was only fed to calves until they were old enough to eat a mixed ration. In Denmark, wheat was the most prevalent grain fed to the milking cows. To make the nutrients in wheat more available to the cow some farms treated the wheat with caustic soda, as a form of chemical processing. This is not something that is practiced much in Ontario as there is a ready supply of corn, which the Danish farmers admitted they would prefer if they had access to it. Fat was also added to the ration to get energy levels up.

Most diets were heavy on forage – running between 60% and 70% forage. Forages are something that can be grown and harvested on the farm and helped to reduce off-farm costs. Most farms managed to grow most of their own feed, from forages to small grains and rapeseed or beans. Commodity grain prices and protein prices, driven by the European market, are high and prohibitive to buying a lot of feed in to the farm. Grass crop silages, as they referred to them, were alfalfa mixes with the goal to get about 18% protein and harvest at 30-35% DM. Three cuts per season seemed to be common on most farms. Most producers counted on the forage to supply the majority of the dietary protein and used rapeseed or fava beans as a concentrated protein source. When asked about feeding soybean meal most producers looked a little shocked and replied that soybeans are too expensive to feed to dairy cows in Europe.

With high forage levels, and high moisture levels in the forages most of the rations were quite wet. Wet enough that squeezing a fistful of TMR produced drops of water and the TMR stayed balled up long after opening your hand. These especially wet rations were popular as the producers said they reduced sorting and kept the rumen more stable.

With all the small grains being harvested straw was used on every farm. Dry cow diets at almost every farm were heavily based on straw with some farms feeding up to 6 kg of straw. Even with that level of straw the diets were still nice and moist due to the wet forages that were also in the ration.

Sweden has another challenge to deal with when it comes to getting proper nutrition into their cows. All Swedish dairy farmers, not just organic farms, are required by law to put

all female cattle older than 6 months out on pasture for 2 – 4 months in the summer for 8 hours a day. Northern regions, that have shorter periods of warm weather, fall into the 2 month category while the southern most regions are expected to have cows on pasture for 4 months. Most of the intensive dairy farms are not a fan of this legislation and noted that production goes down in the summer while somatic cell count and health problems go up. Unlike Canadian organic regulations, where a portion of the diet is expected to come from pasture, the Swedish law only requires that cows go out on pasture. There is no incentive for producers to provide good quality fields for the cows without the regulation that cows need to actually consume pasture. This pasture requirement has also impacted age at first calving, bringing it up to 28 months, as the heifers on pasture are not being intensively raised for growth.

Heavily regulated, with quota gone in the next 6 months the Scandinavian dairy farmers have a challenging time ahead. By making use of feeds that grow well in their climate they produce as much as they can from their own land base, helping reduce off-farm costs and making dairy farming more profitable. Feeding small grain silage or treating wheat to make it more available, these Scandinavian farmers have worked out an effective feeding system using the feeds on hand.

### **The Swedish Dairy Industry**

Sweden has 287,606 dairy cattle as of 2012 and 4,022 total dairy farms. Average production is 9,210 kg of milk per year. Average fat percentage is 4.21 and average protein percentage is 3.46 (Swedish dairy association). Average herd size is 48 cows per farm (Hansson, 2008).

**Reproduction:** Breeding goals in Sweden is often referred to as “the Nordic genetic profile.” This profile focuses both on production and on functional properties. These properties include fertility, calving ability and hoof health (Swedish dairy association). The two most common types of dairy cattle are the Swedish Red and White, which is related to the Ayrshire and the Swedish Holstein (Wedholm et al., 2006).



**Calves:** The majority of calves are kept in individual pens after they are taken away from their mothers. Calves receive milk from their dams for an average of 4 days after birth and then are fed 2.5 liters of whole milk twice a day. On average calves are weaned at 8 weeks of age. Table 1 below shows the distribution of housing system for weaned heifer calves.

Table 1. The distribution of housing systems for dairy replacement heifers in Sweden from weaning to first calving.

Housing system	Weaning to breeding % of herds (n=877)	Breeding to calving % of herds (n=877)
Pen with slatted floors	25	13
Pen with slatted floors and litter pen; combinations over time	15	2
Pen with slatted floors and tie stall; combinations over time	13	9
Litter pen	18*	21**
Litter pen and tie stall stanchion; combinations over time	11	6
Tie stall	7	36
Others	11	13

\* of which 5% had a walkway with concrete or slatted floor

\*\* of which 8% had a walkway with concrete or slatted floor

The most common type of feed fed to weaned heifers is grain, silage and hay. The median age of first breeding time is 16 months (Pettersson et al., 2001).

**Welfare:** Sweden is a leader in the dairy industry and a pioneer in animal welfare. Swedish cows are some of the healthiest in the world and during summer months, every cow has the right to go out to pasture (Swedish Dairy Association). The Swedish Dairy Association has many animal welfare programs that are focused on preventive cattle health. Some of these programs include healthy udders and clinics focusing on somatic cell counts, hoof health, calves, and diseases.

**Feedstuffs:** There are many different types of feed in Sweden. Whole crop refers to when the whole plant is harvested and fed as silage. This can include barley, oats, winter wheat, and triticale. Other feedstuffs that are presented to cows are corn silage, oilseeds such as rapeseed and cottonseed, root vegetables like beet molasses, cereal, grain legumes, and grassland. Larger herds, 80 cows or greater, will be fed a total mixed ration with feedstuffs mentioned above.



**Housing:** Tiestalls are traditionally the most common housing system in Sweden. Short stalls and long stalls make up the tiestall types. Long stalls shut the cow off from feed while the herdsman is not in the barn. Short stalls always allow the cow access to her feed. Loose housing in freestalls is recommended for the cattle and is starting to increase as a housing option as now a quarter of the dairies use freestalls as their housing system (Hultgren, 2003).

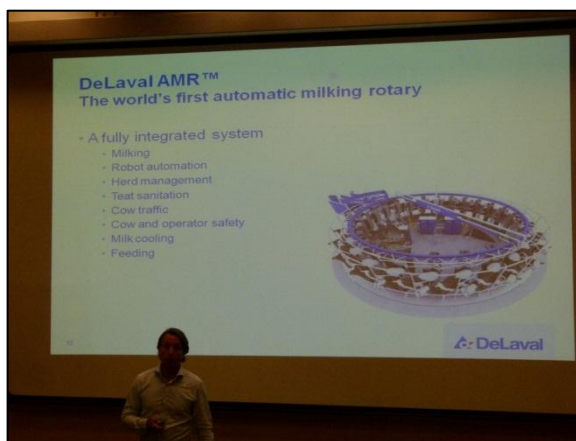
**Farmers Association:** Recently the Swedish Farmers Association and the Swedish Dairy Association have collaborated to form the Farmers Association (LRF). The purpose of this partnership is to strengthen the producer's influence and opportunities on the commercial and political markets. The mission of the LRF Dairy Association is to protect and strengthen the Swedish milk for human consumption.

**Emerging issue:** Like many other countries, a trend in Sweden shows a decrease in milk production and a loss of dairy farms. Producers need to gain confidence in the dairy industry in order for this situation to reverse. The Swedish Dairy Association is working to reverse this decrease through capturing producer's involvement and boosting their confidence. They fear that if the decrease does not have a turn around that milk production will cease to exist in Sweden (Swedish Dairy Association).

In conclusion, the Swedish dairy industry is a leader throughout the globe. They are facing many changes and opportunities with the industry. They are pioneers in the industry with their focus on animal welfare and health of the cattle.

## Monday August 18<sup>th</sup> - Sweden

**DeLaval International AB**  
P.O Box 39, SE-147 21 Tumba  
<http://www.delaval.com>



**DeLaval staff described current products**

The group met with DeLaval Staff to learn about VMS, Herd Navigator, Farm Management and Automation. They visited the DeLaval Factory and VMS barn, followed by a visit to the Exhibition Hall. The group also learned about the DeLaval AMR™ that they saw in operation at the Ottenby Dairy Farm.

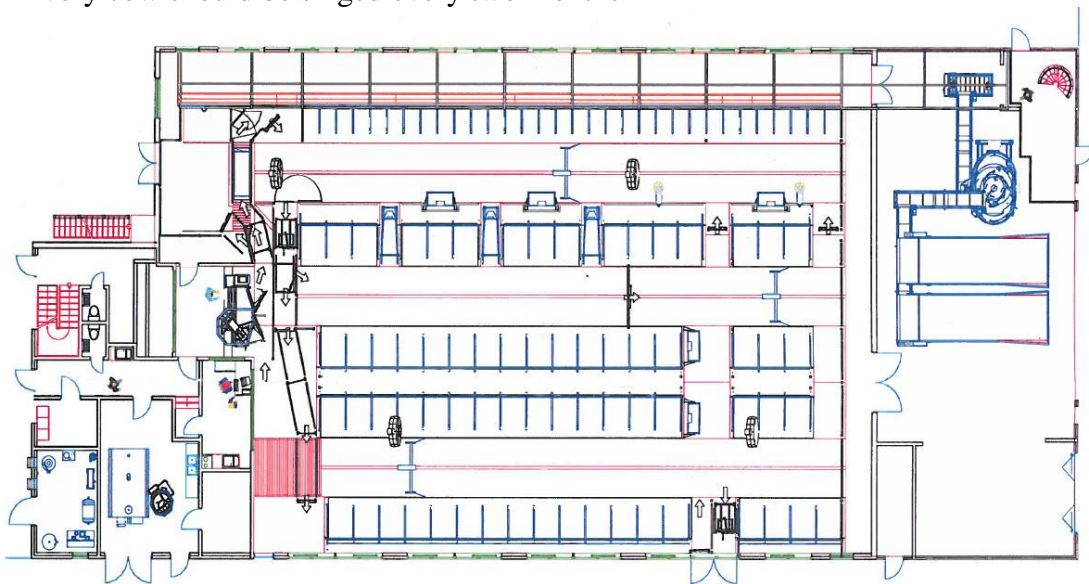
DeLaval was founded in 1883 by Gustof DeLaval. In 1998 they introduced their VMS robotic milker, in 2007 Herd Navigator, and in 2010 the AMR – automatic milking rotary. The TSR – teat

spray robot was introduced in 2012. There are more than 30,000 VMS units worldwide

on more than 15,000 farms. Robotic milking systems have saved the family farm. It is estimated that 20% of the dairy farms in Sweden and Denmark are milked robotically.

### DeLaval VMS Barn

- Constructed in 2002
- 65 to 70 cows
- 68 free stalls
- 1 VMS
  - 6 ½ minutes to milk cow
- Feed first cow traffic – depends on feeding and milking strategies
  - Go through one-way gate to feed bunk
  - Returning go to robot if they have milking permission or return to free stalls
  - 80% of grain fed through feeding stations or the robot
  - Only 20% in PMR
  - PMR delivered between 6 and 8 times per day – keeps sorting low
- 12,500 kg/milk/day on one robot
  - 4.5% fat, 3.4% protein
- Majority of herd is Swedish Red with some Holsteins
- High production herd for breed
- 4 rows of free stalls with perimeter feeding on one side
- Cows have access to outside – regulation is 2 hours per day
  - Starts in spring and ends in fall
  - Consumer demanding this regulation
- Limited feed space, but it is robotic
- Every cow should be singed every two months



## Feeding System

- Optimat automatic feeding system
  - DeLaval stationary vertical mixer VSM8
  - DeLaval concentrate wagon OTS100
  - DeLaval scale indicator SI700
  - 2 x roughage wagons F115
- New horizontal silo for automated feeding system
- Full automation of loading and distribution
- Load forage on buffer tables – 42 m<sup>3</sup> capacity max.
- Load daily
- Minerals etc. in bins
- Can control from tower silos
- Mixer has scales and sensors – it is the brain where everything can be controlled
- Hamra Farm do 2 to 3 batches per day
- Feed delivered 15 to 20 times per day to provide fresh feed in winter

## Tuesday August 19<sup>th</sup> - Sweden

### Sörbås AB.

Kumla, Sweden

Nynäs Säteri 101

SE-69292

Örebro County

+46 (0)70-6287671

### Background Information

- Richard - Half owner
- Bought 2008
- Planned to build a lot of buildings
- Feeding building
- Dry cow and calving barn
- Milking barn
- Grow grass – 450 ha for silage
- Store in tubes
- 280 ha – grain for feed
- 1000 ha permanent grass land including wetland for heifers etc.
- Pasture we see for milking cows – 80 ha around barn
- 600 cows
- 500 milking
- His job is maintenance for robots and feeding
- Organic – grassland and grazing
- 14 tonne to tank every day – goal
- 73 Skr x 9.16 for Euros



- Price going down
- 42 Eu per kilo with premium
  - \$0.61/kg CAD
- 5 Eu premium – 37 Eu for milk
  - \$0.07 - \$0.54
- Organic
- Out on pasture 4 months during summer
- ½ amount of DM from grass
- Need out 2 months more
- Ability to go out and in
- Track what fed in barn
- Can't use any chemical
- That's why they grow clover
- Grass is white and red clover with some alfalfa
- Calf and mother need to be together 4 days – now reduced to 24 hours
- Better for mother and calf reduce weaning stress
- Buy organic concentrate
- Special beans and peas not soy product
- Not worth being organic, but locked into a 5 year contract
- There is subsidy on lands and not just milk price
- Subsidy per hectare and per cow
- Gross income: 88 % from milk



### **Cow Information**

- 500 milking cows
- 8,700 kg/cow/year average
  - 28.5 kg/cow/day
- 4.0% fat
- 3.4 % protein
- 200,000 SCC
- 0.42 EUR/kg average price in 2014

### **Milking System**

- Two 5 Box Mlone GEA robotic milking systems
  - 3D camera to locate teats
  - Cow traffic: 1 selected entrance, 1 guided exit
- 30,000 l bulk tank
- RPS 2 x 1200 vacuum pump with variable frequency (speed) drive

### **Milking Barn**

- 2011 new free stall barn for 500 milking cows



- 6 row perimeter feeding
  - Mats with minimal amount of bedding
- 2008 new free stall barn for 140 milking cows – now replacement barn

### **Manure System & Storage**

- Alley scraper to transfer tank to long term storage
- Slatted floor in robot holding areas
  - Rubber on slats in holding area

### **Feeding System & Storage**

- Mullerup automatic feeding system.
- Mullerup Feed System
  - [http://mullerup.com/produktsider/mixfeeder/Mix\\_Feeder\\_Mullerup\\_LowRes\\_GB\\_279854.pdf](http://mullerup.com/produktsider/mixfeeder/Mix_Feeder_Mullerup_LowRes_GB_279854.pdf)
  - 3 hours to feed
  - Feed transferred to milking barn by conveyor then loaded into track feeder
  - Track feeder for heifer/dry cow barn loaded directly in feed kitchen
  - Annual maintenance cost – 400,000 SEK (~\$70,000 CDN)
- Feeding in performance groups
  - High group
  - Dry group
  - Cattle/young cows
- TMR ration for 23 l
  - 10.5 kg grass silage
  - 3.0 grain whole crop
  - 3.8 kg grain (smashed)
  - 55% rapeseed meal
  - 500 gm straw
  - 500 gm minerals



- Nutrition work done but outside company
- Feed groups: high production, dry, heifers, calves
- Feed for 23 L production in TMR + robot pellet
- Forages
  - Alfalfa/Grass silage – mix of white and red clover and lucerne (10.5 kg/d)
  - Whole crop grain – like a small grain silage (ryelage/oatlage etc) (3.0 kg/d)
  - Straw – (0.5 kg/d)
  - Goal is 30% DM, 16-18% protein for alfalfa silage – no bunkers just Ag bags
  - Do not use a silage preservative
- Concentrates
  - Smashed grain – small grains (no corn), 280 ha grown on farm (3.8 kg/d)
  - Rapeseed meal (55%) (didn't give amount in feed)
  - Mineral

### **Replacement Management**

- 35% stock replacement rate
- 380 day average between calving
- 25.6 months average age for first calf

### **Land Base and Crop Management**

- Lake bottom / humus soil
- 2,470 acres
  - 690 acres grain
  - 1,100 acres hay
  - 670 acres pasture

### **Otterslatten Lantbruk AB.**

Otterslätten

548 92 Hova

SWEDEN

+46707303925 William

+46707443378 Bram

[otterslatten@hotmail.com](mailto:otterslatten@hotmail.com)

### **Owners**

The Krijger family: Peter and Gerdy and their sons Bram and William

Peter is semi-retired does some tractor work.

Gerdy does the financial book work.

Immigrated from Holland in 1976.

Bram is head manager of the milk production.

William manages the field work and does the financial planning with Gerdy.

Bram and William manage the labour together.

Helena is herd manager.



### **Employees**

6 full times hired labour.

Helena is our herd manager. Thomas daily feeding and seasonal field work.

We have 4 persons from Lithuania. They work for 3 months and have 1 month free.

Dale, Mindogas and Wisvoldas are our milking staff. Reggis does cleaning, bedding and other farm works. When Reggis is free Mindogas does his jobs

- Parents immigrated from Holland 38 years ago
- Brother Bram – 37
- William Krijger - 36 years old
- Immigrated to south and worked 9 years
- Built barn in 2001 with concrete walls
- Expanded to 250 cows
- Herringbone parlour in 1994

- 2006 expanded to 400 cows
- Sent away all the heifers
- 2008 built new heifer barn
- 2008 converted to organic
- 2011 built new milking barn with new parlour
- Milking 400 cows
- 480 to 500 throughout the year
- Keep all pure bred heifers
- Cross breeding the lower quality cows with beef and sell at 2 to 3 weeks
- All bulls and cross bred
  - Aberdeen Angus
- Cow – Fleckvieh
- Different responsibilities
- Field work, planting
- Bram – breeding, cows
- Both work with cows on a daily basis
- 12,000 to 14,000 EU per hectare
- Leasing 200 EU per hectare
- Growing whole crop silage
- Wheat and oats and grass under seeded
- Plow every two years
- 150 to 180 ha whole crop
- 300 ha grass
- 150 ha for grazing
- All cows & heifers have to go outside
- Arla Foods for producer
- Current milk price barely profitable – crisis in Russia
- High price was 4 months ago 35 EU cents
- Coming years will be tough
- Manure separator runs 2X per day
- Important to use separated solids fresh
- Important to keep the stalls clean
- Use Bodman cleaner – bought same time as separator



### **Crops Grown**

600 hectares in total. About 200 owned and 400 leased.

Gras silage: 300 hectares

Whole crop silage: 150-200 hectares

Grazing land: 150 hectares

### **Cows Milking**

About 480 year around cows, 400-420 milking. Organic production.

Average 8 300 kg/year around cow, 3,8% fat, 3,1% protein.

2x milking

- Sweden has quota but only fills about 90% of its quota so herd expansion is not a problem. Producers not concerned about quota disappearing in Sweden but are worried about low milk prices.
- Milk goes to Arla (80% of milk in Sweden is processed by Arla)
- Milk price “not great and going down”
- \$0.49 CDN/L + \$0.11-0.20 CDN/L organic bonus (max \$0.69 CDN/L)
- 27 L/cow/day
- Fat – 3.8%
- Protein – 3.1%
- SCC – 160,000-200,000

### **Milking System**

- Delaval rotary parlour 24 stalls – not AMR but able to convert
- Milking takes 5-6 hours – staff changes ½ way during milking from attaching milkers to pushing cows up
- Pre-dip cows, no post-dip
- Can milk 70 cows/hour

### **Milking Routine**

SCC 160-200.

1 Pre-dip with disinfection solution, 2 strip to check milk, 3 dry wipe with paper, 4 attach cluster.

This routine is done with 4 cows in a row to get the correct time between starting prep to attaching cluster.

### **Housing**



Big production barn: 3+3 row centre feed alley, free stall with thick mattresses, 135 + 125 stalls. Insulated roof and walls, frost-free in winter.

Small production barn: 5 row outside feed alley, free stalls with mattresses, 110 stalls. Cold barn.

Special needs barn: 2+3 row outside feeding system. 90 stalls, 2 big straw bedding boxes, 6 smaller boxes with thick mattresses. Insulated to keep frostfree. We have mattresses in all freestalls. We

use DMS from a FAN-separator.

With every milking we clean and put in new DMS with a Bobman sweeping and bedding machine.

### **Feed Storage**

Concrete bunker silos for silage: 4x2000 m<sup>3</sup>  
3 Small concrete silos for various use: 6x20 m  
4 silos for dry feed storage: 4x16 m  
Barn for straw and dry feed: 16x35 m

### **Feed Delivery**

Self-propelled mixer wagon, Trioliet Triotrac 24m<sup>3</sup>.

5 TMR rations: Milking cows, Dry cows, Young heifers, Calves, Calf musli.

- Feeding wagon – 2 to 2 ½ years old
- 3000 hours

### **Ration**

Because we are organic we use a lot of forage, 60-70 %.

We use also ground grains, Oats, wheat and barley.

Ground beans and peas and cold pressed oil rape seed.



### **Reproduction**

We use Heatime heat detection system, for both cows and heifers.

We don't use synchronization drugs. It's not allowed in Sweden for regular use.

Pregnancy check is mainly manual, we use some ultra sound.

### **Genetics**

High overall conformation with functionality are the goal, bulls are selected on conformation milk yield and health traits. We are using beef on the poorer cows and heifers and only pure-breed Holstein for replacement 30%

### **Health Management**

We only vaccinate calf against ring worm skin disease.



### **Manure Handling**

All manure collects to a pumping pit and goes through the separator.

The fluids stored in different tanks, in total 11,000m<sup>3</sup>.

The solids are stored on concrete plates.

The solids are spread before plowing.

Fluids are spread with tanker wagons with 12m dribble bars mainly in growing crops.

## Calf Management & Housing

Colostrum 2-4 litres with bottle as soon as possible after calving.



2-4:th feeding colostrum if available and then mix with regular milk.

All calves giving pasteurized whole milk up to maximum 10 lit/day.

When calves 8 weeks we start decreasing milk. 12 weeks they are free of milk.

Due to organic rules they must have milk for 12 weeks.

They get musli and fresh water from the start. When 6-8 weeks they start getting TMR specially mixed for calves up to 8 months.

Single housing 2-3 weeks then group

housing 8x up to 5 months.

## Heifer Management

Freestall barn for heifers from 5-6 months to 1 month before calving.

Calve TMR up to 8 months, Heifer TMR to 16- 20 months depending on body condition, Dry cow TMR to calving.

Starting insemination on age, height and weight score, 13.5 months, 135 cm and 400 kg

Lunch – **Norrqvarn Restaurant** by the Gota Canal

<http://www.gotakanal.se/en/products/45723/Norrqvarn-Hotell-Konferens-Restaurant/>

The restaurant serves up what's available from local producers, which is why the menu changes so often.

In the hazy-lazy days of summer you can enjoy canal-side Gubbröra, an egg-anchovy salad, usually served on rye bread, or with new potatoes. You'll probably also find the local pike-perch or perch on the menu, along with beetroot and the local goat's cheese.



**Stallberg Lantbruk AB**  
Vara, Sweden,  
Mats and Thomas Larsson



Stallberg Lantbruk AB is a family owned business since 1880 when the existing owner's great grandfather bought the 75 acre farm. In 1989 Mats and Thomas became partners with their father Sven, milking 42 cows on the 225 acre farm. In 1993 a barn for 120 cows was built and in 2007 the heifers were rented out and 210 cows were milked. Today the farm size is 1,100 acres with another 125 acres for pasture and 75 acres of forest.

**Cow Information**

- 280 milking cows at present
- Expanding to 420 by May 2015
- 35-36 Kg/cow/day
- 4.0-4.1 fat
- 3.3-3.4 protein
- 150,000-250,000 SCC

**Milking System**

- 6 Lely Astronaut A4 milking robots expandable to 8

**Facilities**



- In 2013 to 2014 a new barn for the milking cows, heifers, feed kitchen, horizontal silos, and manure storage was built.
- The barn for the milking cows is insulated, while the heifer barn is not.
- The milking barn has free stalls with deep bedded compost
- Some problems with compost bedding
  - Too wet: 75% MC
- JHminiStrø automatic bedding delivery system
  - <http://jh-agro.com/bedding-and-feeding-systems/>
- 6 row with centre feeding
- Some Lely Commodus stall dividers
- Lely Luna cow brushes

## Manure System & Storage

- Slatted floor
- 2 Lely Discovery robotic slat cleaners
- Manure separator

## Feeding System & Storage

- 2 Lely Vector fully automated feeding system
- 3 mixing and feeding robots
  - [http://www.lely.com/uploads/original/documents/Brochures/Feeding/Vector/Vector\\_EN.pdf](http://www.lely.com/uploads/original/documents/Brochures/Feeding/Vector/Vector_EN.pdf)
- One feeding system for milk cows and one feeding system for young stock/heifers
- Able to make 16 different recipes per feeding system
- As robot going through barn measures how much feed is left at the bunk and then signals the feeding system which group needs feed mixed
- Robot also pushes up feed as it is checking bunks
- System can prioritize groups – if heifers and milk cows both need feed will mix milk cow first, or prioritize high production group over low production group
- The delivery robots may have issue in winter with snow and ice (hasn't run in winter at this farm yet). But can salt track
- Needed the Lely Vector system to meet CO<sub>2</sub> regulations – less time running a tractor
- 1.2 million SEK for each Lely Vector (\$ 200,000 CDN)
- Need to put feed in the “kitchen” only every 3 days – feed cut into blocks for the crane to pick up which allows it to keep longer after removed from the bunk – need a special “block” cutter
- Maintenance cost 50,000 SEK/year/unit for full coverage (\$8,000 CDN)– service contract for 24/7 guarantees on farm within 2 hours
- Long hay is not recommended – mixer holds 500 kg mix, long hay will take up too much space in mixer
- Crane can grab 80 kg at a time – scale on mixer not crane, but crane system designed to only lift 80 kg max
- Feed fermented feeds to calves – very young
- Dry cows get straw and grass haylage (smelled musty)
- Feeds fava beans for protein



### **Replacement Housing**

- Calves started in individual raised pens in separate room
- Weaned to group pens
- One pen of dry cows with compost bedding
- Maternity pens with deep bedded straw

### **Land Base and Crop Management**

- 1,100 acres
  - Haylage, corn silage, barley and faba beans
  - Winter wheat as a cash crop
- 125 acres for pasture
- 75 acres of forest

**Wednesday August 20<sup>th</sup> - Sweden**

### **Torp Lantbruk**

Månstad i Tranemo,  
514 53 Månstad, Sweden

- Elin and Patrik Johansson
- 5<sup>th</sup> generation family farm
- Started with 90 cows – now 420 cows
- 72 are milked in old barn
- Yesterday average was 37 kg of milk per cow per day
- ECM of 11,000 kg



### **Milking Barn**

- New barn in March of 2010 – herd from tie stall barn and neighbour's herd they bought and another herd
- 3 herds and 4 VMS milkers
- Have a lot of gates for sorting
- Barn divided into two parts with 2 VMS each
- 4 row slatted floor barn with feeding on one side
- Fed with automatic DeLaval Optimat
- Step at feed manger
- Recessed feed manger with vitrified tile liner



### **Calf Barn**

- New calf barn 2011

- Robotic feeders
- Peat moss (turf) bedding
- Calves are kept in raised pens in maternity barn for several days
- Heifers out on pasture
- All animals out for 90 days every year
- Out eight hours per day
- Easy on a dry summer – not easy when wet
- Milk level is high until cows go to pasture in May
- SCC goes up – cows love to drink bad water
- In old barn – let them out in morning, not many trees, get sun-burned
- Have to keep records of cows that are kept inside
- Always afraid of government inspectors that can show up any time
- Can fine % of payment from European Union
- Constantly on mind
- Three years ago they were on holidays and got a call from inspector – answer the phone, have to come within 24 hours
- Not an organic farm
- Milk is biggest income
- They do custom field work
- Harvesting turf grass
- Income from forests
- Russia has affected milk prices
- \$3.20 SEK per litre
- Like new things and like to try new things



### **Feeding**

- Have outside feeding advisor
- Have the Delaval Optimat feeding system – first on commercial farm
- Buffer tables for temporary storage of feed before mixing
- From buffer table to mixer and then to feed wagon
- A lot of service – at least 1 hour/week
- Fed 20x/day – cows didn't have much feed in the bunk, maybe the mix is too small at 20x/day
- Currently feeding: 3C grass haylage from last year, beet pulp, whole crop silage, protein mix, minerals
- Last year had 3 good cuts but low yielding – normally only give milk cows 1<sup>st</sup> and 2<sup>nd</sup> cuts and save 3<sup>rd</sup> cut for heifers but short on feed
- 7-8 kg of concentrate/cow/day
- PMR bunk mix balanced for 23 kg milk – haylage, protein mix (a little), premix
- Don't want to feed too much in bunk or the cows don't go to robot
- Most of grain through robot/feed station – think if feed more grain in bunk need milk first traffic



## Sustainable milk production



### Farm profitability Deciding factors for various investment

- Good cow health
- Good work environment
- Automation results in financial benefits

### Animal welfare

- A healthy cow is a good, profitable cow
- We devote a lot of time to our heifers and newly-calved cows

to give them the very best start. Focus on calf health

### Environment

- Frequency-controlled vacuum pumps
- Heat recovery from milk and machine room
- Natural ventilation
- Light relays and time-controlled lighting

- Time-controlled manure removal and pumps
- Effective logistics and automatic feeding system

### Social responsibility

- Plan to reduce heavy work and thereby create a good environment for animals and work
- Easy animal management

### Details about the VMS barn

**Milking equipment:** 4 x VMS stations, 2 equipped with online cell counter (OCC)

**Herd management:** OCC

**Milk tank:** DXCEM 24,000 litre

**Feeding system Storage:** 4 bunker silos measuring 51 x 8 x 3 m and 3 measuring 27 x 9 x 3 m

**Feeding:** Feeding system Optimat Master Feed wagon RA135

**Concentrate Storage:** 3 x MAFA Unik concentrate silo 12 x concentrate stations

**Calf feeding system:** 2 x calf feeder CF1000+ (serve 4 calf nipples each) plus 1 x calf feeder CF150X for bull calves that drink separate milk.

**Manure system:** Rubber covered slatted floor at the feeding table. Manure scraper for cleaning slatted floor. Hydraulic manure scraper under slatted floor. Hydromat manure press in the gutters.

**Fittings:** Cubicle CC1800, headlocks.

**Ventilation:** Ventilation inlets with self-ventilation and panels on the long sides.

**Getting there:** From Ulricehamn Route 57 to Tranemo, pass Gällstad. After 7.7 km, turn right at the sign Månstad. Drive past Månstad church, continue for another 5 km toward Svenljunga. Torp is on the left.

From Göteborg Route 40 to Borås. Take route 27 to Växjö, drive 35 km, turn left at the sign Månstad and continue another 3 km. Torp is on the left.

# Torps Lantbruk, Månstad



New VMS barn with FeedFirst™.

## Details about the farm

Name of the farm: Torp

Owners: Elin and Patrik Johansson  
Address: Torps Lantbruk  
514 53 Månstad

No. of employees: Six employees, three of whom work fulltime with farming machinery

Contact: Elin Johansson

Division of duties: Elin: Animals  
Patrik: Equipment, service and all work in the field together with Jacob Danielsson.  
Eva Tagesson: Cows and pregnant heifers  
Madelene Karlsson: Heifers and calves

Area: ≈ 320 hectare land including leasehold land and 100 hectare grazing land

Size of barn: 180 x 20 m

Built: 2009–2010, taken into operation March 2010

Total investment: SEK 30 million including bunker silo, manure tank and herd

## Milk production

No. of cows: 400, of which 72 are milked in the old barn

Recruitment: 400

No. of milkings/day: 2.4 per cow

Milk quantity/day: 32–33 litres per cow

Yield: 10,200 kg ECM

Cell count: 150,000

No. of inseminations: 1.9

Calving interval: 12.4 months

Age of heifers at calving: 25.4 months

# Layout of Torps Lantbruk



Buffer tables for the different types of feed.



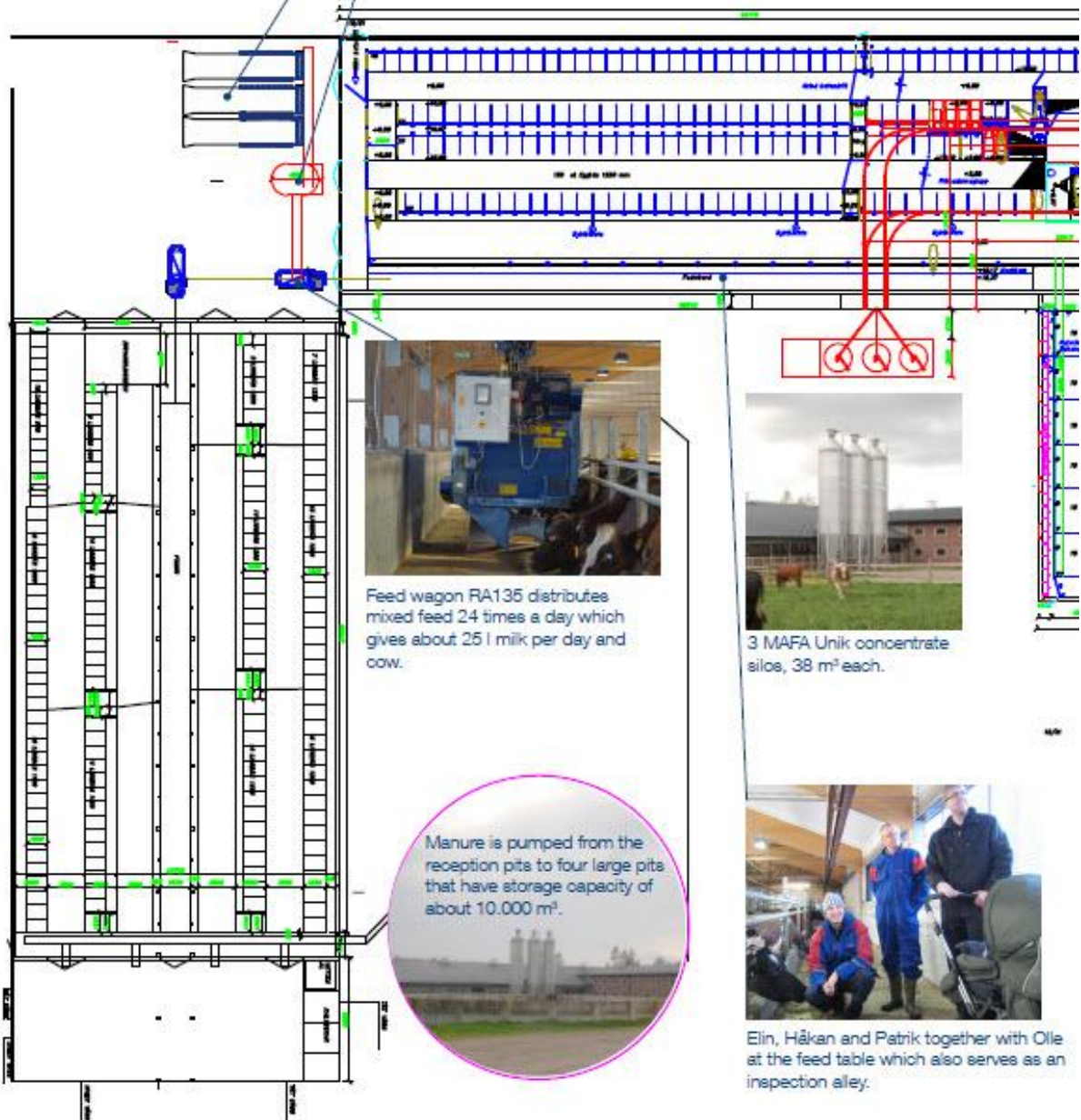
Optimat Master offers automatic mixing and feed wagon loading.



The old barn, built 1920, is still in use.



Overlooking a bright and pleasant barr



Feed wagon RA135 distributes mixed feed 24 times a day which gives about 25 l milk per day and cow.



3 MAFA Unik concentrate silos, 38 m³ each.



Manure is pumped from the reception pits to four large pits that have storage capacity of about 10.000 m³.



Elin, Håkan and Patrik together with Olie at the feed table which also serves as an inspection alley.



Pleasant conference room one floor up.



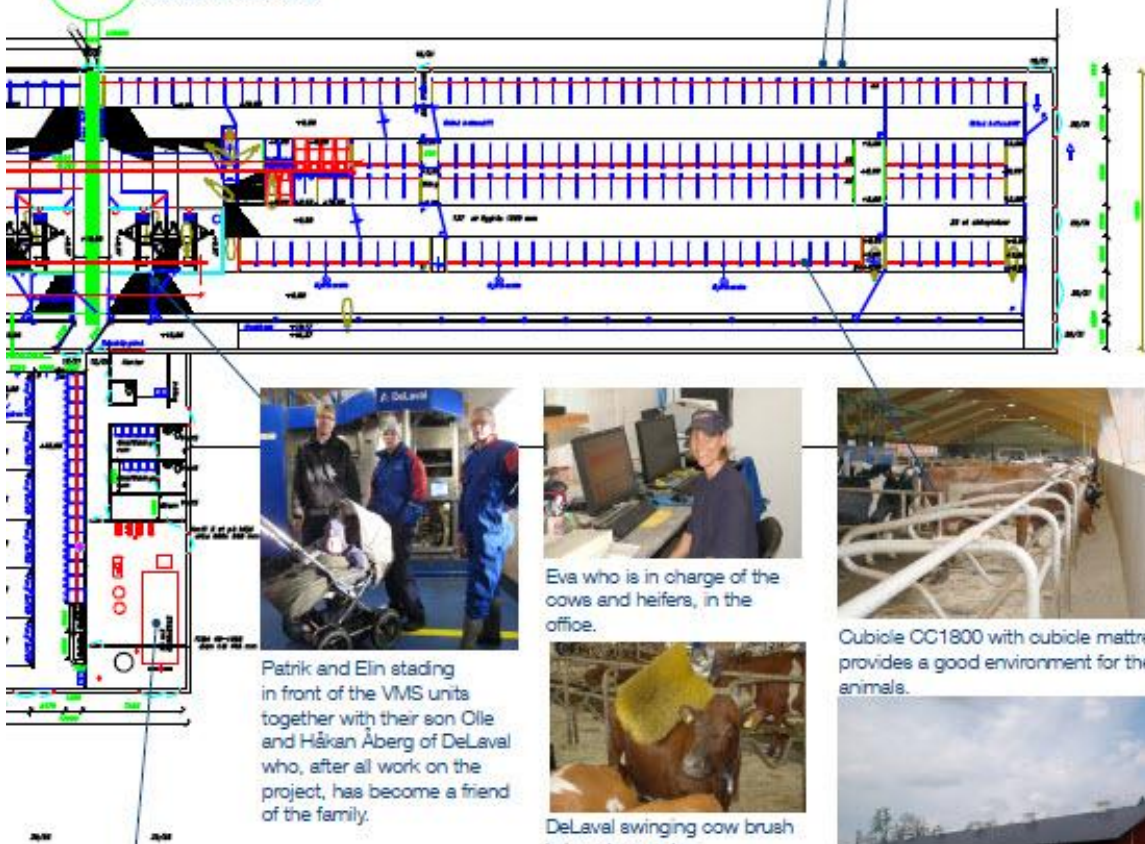
Board room where important decisions are made.



Wall inlets with self ventilation combined with ventilation panels guarantees perfect indoor climate.



Ventilation panels.



Patrik and Elin standing in front of the VMS units together with their son Olle and Håkan Åberg of DeLaval who, after all work on the project, has become a friend of the family.



Eva who is in charge of the cows and heifers, in the office.



DeLaval swinging cow brush is hugely popular.



Cubicle CC1800 with cubicle mattress provides a good environment for the animals.



Separate calf barn for calves between one week and six-months.



Calves on peat and straw beds under shelter for a draught-free environment.



24,000 l cooling tank DXCEM. 400-liter buffer vessel.



A manure scraper was installed to achieve maximum cleanliness. One of the products that gave the best ROI within one year. "The scraper is always on time and handles the dirty work, without extra pay," jokes Elin.

## The Kronoberg Agricultural Museum



The history of agriculture in Kronoberg County is preserved in its very own museum. The museum charts the changing circumstances of local farmers throughout the years. Kronobergs Lantbruksmuseum is open during the summer months. The

Museum also includes a nice café (**Hjärtenholms Gårdscafé**)

The Kronoberg Agricultural Museum is situated just north of Alvesta

<http://www.kulturparkensmaland.se/1.0.1.0/68/2/>



## Ottenby Kungsgård

206, 380 65 Degerhamn, Sweden

Ottenby Kungsgård is owned and managed by the families Wiström. They are 3 brothers, and the youngest, Andreas is responsible for Ottenby.

1400 ha from which 220 ha fields, and the rest pasture, meadow and some forest. 500 milking cows, 500 heifers, 200 milking cows and 200 beef cows + 400 sheep. On the fields they grow hay and spring corn. 4.5 employees in the cow barn who run the milk cows and heifers. Meat cows and sheep are taken care of by the outdoor employees. The yield is about 10 000 kg ECM, 13.4 months of calving interval. They inseminate on their own.



- Farm is owned by the government and leased to producers
- Three partners

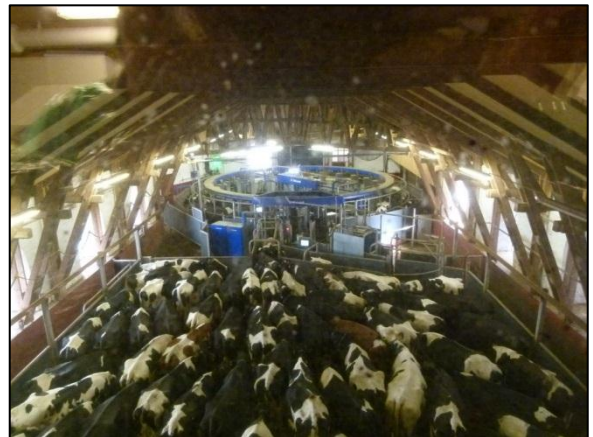
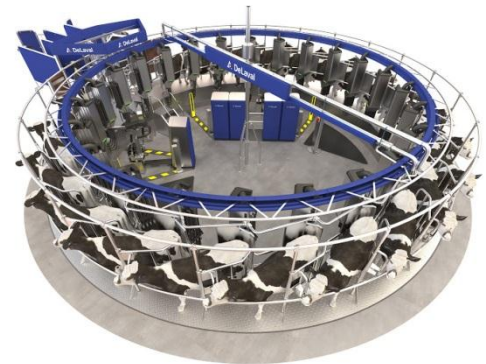
- King originally owned it and still hunts on the reserve
- A stone wall is located 2 to 3 km up the road and runs across the peninsula to keep the game in



- The King visited the farm the day before we arrived
- SCC 250,000
- Shavings for bedding
- Manure transferred to satellite storages
- Alfalfa and corn silage
- 3 groups of cows
- 500 cows in total
- 13 month calving interval
- Transponders for activity monitoring

#### DeLaval AMR™

- Ottenby is one of the first commercial dairies with a DeLaval AMR automatic rotary.
- AMR on farm for two years
- Milk twice per day
- 200 cows per day through parlour
- By end of 2014 plan is to milk 450 through parlour
- Internal 24 rotary
- 5 robots used to milk cows
  - First two robots do teat preparation
    - Robot 1: cleans rear teats
    - Robot 2: cleans front teats
    - Teat preparation the same as all other DeLaval VMS systems
  - Next two robots attach teat cups
    - Robot 3: attaches front teat cups
    - Robot 4: attaches rear teat cups
  - Final robot applies teat spray
    - Robot 5: applies teat spray
- Rotary stops at each station
- Try for less than 40 seconds per stop
- Takes about 9 minutes to turn
- 90 cows per hour
- Cows can go around twice if not milked the first time
- 1600 milkings per 24 hours



## Kalmar Castle

<http://www.kalmarlott.se/english>

Kalmar Castle is a legendary Swedish landmark whose history can be traced to as far as 800 years. It was originally built as protection against pirates and other enemies coming in from the sea. Tagged as “The Key to the Kingdom”, the castle played an essential part in Nordic politics. In 1397, it was the site of the signing of the Union of Kalmar wherein Sweden, Denmark, and Norway were united under one crown. In the 16th century, the fortress was transformed into a Renaissance Palace under the direction of the Wasa Kings Erik XIV and Johan III. Today, it stands as one of the best preserved renaissance castles in Europe.



## Thursday August 21<sup>st</sup> - Sweden

### Swedish Welfare Experience

Dr. Charlotte Hallen Sandgren  
The group was fortunate to have Dr. Charlotte Hallen Sandgren, a local veterinarian from Kalmar give a presentation on the Swedish Welfare experience.



### Pasture Regulations

- Sweden is EU member and has open market between other member countries even though they have different regulations
- No real point in educating customers unless the Swedish product is well branded
- Astrid Lindgren, the author of the Pippi Longstocking series, targeted getting cows out on pasture and was “granted” the legislation as a birthday present
- A target study showed that 2 months of 6 hours/day of pasture has no benefit for cows
- Northern sections of Sweden have 2 month minimum, Middle Sweden has 3 months and Southern Sweden has 4 months of pasture minimum
- Lameness is currently the only measure considered when judging the “benefits” of pasture
  - Milk production and SCC are not considered
- To decrease lameness in cows pasture must be in good condition – which must be enforced with

- laws
- Instead of a pasture law where animals are required to go outside it would be “better” to have a law where a set amount of the diet must be provided by pasture (forces pasture management)

### **Animal Protection Act**

- Compulsory pasture
- Phase out tie stall barns (not allowed to build new)
- No “mutilations” – dehorning does not count
- No electrical devices – electric fencing does not count
- Anesthesia is required for all surgical procedures

### **Cow Welfare Discussion on Bus**

We continued the discussion on the bus about cow welfare experiences in Sweden. We broke up into small groups and tried to tackle the issue of how we could avoid the pressure to enact pasture legislation similar to Sweden in Ontario and Canada. At some point retailers are likely to see that this is a good thing and may work to force the industry into providing time on pasture for dairy cows.



### **Ideas from Group**

- Take a proactive approach
- Enact a producer audit system before the government makes up the rules
  - Prove you are doing a good job and put it on paper
  - Penalty if you don't meet a certain standard
  - DFO is currently working on such a plan
  - Standards should not be complicated
  - Needs to be something that can be measured and put on paper
  - Possibly something that can be incorporated with CQM, and not a complete and complicated standard
- Educate consumer
  - A recent open house had 3,600 through
  - Have open doors so consumers can see what goes on inside
  - Don't pit one producer against another i.e. organic better than conventional
  - Better word for conventional dairy farming – perhaps modern dairy farming
- Put the right message on milk cartons
  - Not cows on pasture
  - Comfortable contented cows in a barn
  - Blue cow symbol = happy cow
- Promotion of dairy farms

- Breakfast in the country
- City in the country
- Promote milk and dairy products better in schools – part of breakfast program
- Consumer field days
- Circle tours
- Part of school curriculum – Dairy Days
- Possibility of pasturing dry cows and heifers
  - Vacation for dry cows
  - Give them a choice to be inside or outside
- Promote Robotic or Voluntary Milking
  - Gives cow a choice of when and how often to be milked
  - Allows for freedom of movement between in daily routine
- Make people aware of the negative aspects of pasture
  - Heat stress
  - Sun burn
  - Flies
  - Lameness
  - Foot health
- Change advertising
  - Instead of athletes show cows
  - Possibly highlight producers
- People, Money, Plan Approach
  - Use some of the money designated for research and put it into education and marketing
  - Start with producer – measure and benchmark cow welfare and build a story
  - Use Social Media to advantage – positive stories about cow welfare
  - Lobby – need to be close to politicians, invite them to open houses and events, show them how cows are positively treated
- Use Social Media to advantage – positive stories about cow welfare
  - More storeys like Dairy Carrie
- Different Levels
  - Switzerland has Naturaplan products
  - Normal, Organic, Naturaplan
  - Consumers pay more for the level of the product

Jack Rodenburg also offered his comments on Swedish pasture legislation in the following article:

*Progressive Dairy Operators Tour report:*  
**Lessons learned from Swedish Pasture Legislation**

Jack Rodenburg, DairyLogix



As part of their quest for excellence in dairy herd management, the Progressive Dairy Operators group has organized numerous local and international tours. Last August, 60 members of the group visited 16 exceptional dairy herds in Sweden and Denmark, with two primary objectives. The dairy sector in these countries is well positioned to produce milk efficiently, but producers have faced some challenges that are just emerging as issues for our industry here. Labour costs in these countries are very high and as a result dairy farmers have been quicker to adopt further automation such as automatic feeding and bedding. Learning about these technologies was one goal of the tour and it will be covered in future articles. These countries are also much more experienced in dealing with consumer demands for animal welfare standards, so learning how the industry has responded to this was another goal of the trip.

In that respect, Sweden's pasture legislation became the subject of much discussion among ourselves and with the farmers and experts we visited. Swedish society has adopted very comprehensive animal protection legislation and feels they are world leaders in this area. Livestock welfare has been a high profile topic in Sweden for many years, primarily because of Astrid Lindgren. This famous author of the Pippi Longstocking books wrote extensively about rural life in the 1950's. She objected to intensive livestock management practices and she wrote a book entitled "My Cows Want to Have Fun" which is still widely read and quoted. The animal protection laws were enacted by the Swedish parliament in 1987 as an 80'th birthday present for Astrid. While many of the standards in the law are clearly beneficial and reasonable, the pasture requirement has become a serious problem for well managed modern dairies. The legislation requires that all female cattle over 6 months of age are pastured for 8 hours per day for at least two months per year in northern Sweden and four months per year in the south. In these periods cows must be locked out of the barn and detailed records must be kept. A team of inspectors monitors livestock operations, and fines for failing to comply can run into ten thousand dollars or more.

Three of the dairies we visited had chosen to produce organic milk, at least in part because the rules were not that different and they received an \$0.11 per liter premium. The pasture requirements for these herds were comparable in terms of the number of days but as a minimum, 50% of the dry matter consumed in the pasture months had to be from organic grass. Unlike in Canada, organic farmers in Sweden are also allowed to use antibiotics to treat sick animals. Organic milk consumption is about 10% of the total market in Sweden.

The three conventional dairies we visited all expressed major frustration with the pasture law. In their experience milk production always goes down when cows are turned out, because feed quality and intake is unpredictable. They also complained about an increase in clinical mastitis incidence and higher cell counts in the pasture season and they reported extra labour was needed to incorporate this dramatic change in management. Two of these dairies had adopted robotic milking which meant they also had to deal with the challenges of maintaining voluntary milking frequency when cows are further from the robots and access is restricted. In the eyes of these producers, complying with these regulations cost them money every year and made them less competitive with other countries in the European Union. The Swedish dairy industry is shrinking and in their eyes the requirement to pasture is a contributing factor.

In contrast Danish farms are not required to pasture and although processors pay a premium for milk from pastured cows the use of pasture in Denmark is decreasing. In our own discussions about this issue we recognized that the circumstances in Sweden made it nearly impossible for producers to take proactive steps to prevent this restriction from being placed on them. Since our group did not feel that such restrictive policies were beneficial, on one of our longer rides on the bus we organized a formal brainstorming session to develop strategies to ensure that Canadian consumers would never require this of us. The main things that came out of this discussion include the need to be proactive and to demonstrate that the welfare of cows housed in modern farms is excellent. The group felt that standards developed by the industry and audits to see that those standards are met are valuable, and consumer focussed open houses such as "breakfast on the farm" programs are needed to show the public that our cows are comfortable and well cared for. We also felt that unbiased research and field trials that define both the bad and the good sides of pasture vs. housed management is needed in Canada, so we can address public concerns. One specific problem that is clearly less severe in pastured cattle is lameness, so this is an issue we need to tackle with more consistent good management and also more research.

Our group also recognized that the pasture question is very strongly linked to industry image and that perhaps the image we promote may be sending the wrong message. It was pointed out that milk cartons and dairy promotion often feature pictures of grazing cows, and if this is not the real norm for our industry, perhaps we should try to raise the image of housed cows instead. Several people in the group felt that it was very important to actively defend our industry against the claims of animal rights groups. They offered "Dairy Carrie" as a good example of pro livestock agriculture activism.

Last on our list of options we discussed the possibility of an open door policy where cows could go out if they wanted, or possibly a requirement to provide some unrestrained time for cows housed in tie stalls. We also discussed giving consumers the option to pay a premium to reward farmers who put in the extra effort to provide grazing and suggested this could be best accomplished without actual product differentiation. Assuming the consumers who want cows pastured have this interest because they want to influence the management of the cows and not because they feel the milk is different, the "pasture premium" could be collected on any milk product with minimal differentiation in

packaging and without setting up a separate distribution system, as long as the premium went to producers using pasture.

The last farm we visited in Sweden left a very clear and strong impression on us with respect to the grazing issue. The Wapno Gard Dairy milks 1400 organic cows and makes a point of involving consumers in their business. Consumers are encouraged to visit the farm and all the barns and the parlor have viewing platforms that allow the public to see what is happening. With thousands of visitors, the high standard of cleanliness, cow comfort and gentle handling is part of their daily reality here. The farm also features a retail store where dairy products processed on the farm are sold, and their branded milk is sold at a premium in grocery stores. Each year May 12th is a very special day at Wapno. That is when the 1400 cows and their offspring are first turned out to pasture. Many of us may have forgotten how cows respond when you first let them out, but there is no doubt that they look happy as they gambol around with tails in the air. And at Wapno, 6000 consumers come out on this day and line the roads around the farm to witness this event. Undoubtedly that sells a lot of milk for Wapno, but we imagine for those farmers lobbying to repeal the pasture legislation, no message could be worse than this.



In contrast our first stop in Denmark also included an open barn policy and retail milk sales. But in this herd the "story" incorporated modern technology like robotic milking as well as clean comfortable surroundings in the barn. While we visited there, two young moms drove into the yard and took their preschool children into the barn and sat by the calving pen while a cow licked off her newborn calf. And before they left, they bought their milk from a coin and credit card operated bulk dispenser in an unmanned separate retail area near the milk house.

Undoubtedly connecting with the consumer will become increasingly important to us here in Canada as well, but as we head in that direction we need to be very conscious of the messages we send.

## **Wapnö: Wapnö Gård**

215, 30591 Halmstad, Sweden

[www.wapno.se](http://www.wapno.se)

Wapno Dairy, a commercial farm with 1400 organic cows and a retail/tourism/education component. After lunch our tour will focus on their digester and on the business of combining farming and tourism.

Wapnö has been working actively for a sustainable environment for many years and we are going that extra mile to look after our animals, our land and consumers. We believe that the present generation should take care in using natural resources reasonably and being environmentally responsible so that we leave the environment as untouched as possible for future generations. Our way to contribute involves animal welfare, sustainable farming and reducing our energy consumption. At Wapnö, we let the milk run in a pipeline 30 meters from the barn to the dairy; no transportation of the milk is required and that is not only good for the environment it also provides really fresh products.

Wapnö farm biogas contributes to renewable energy in the form of electricity, heat and cooling, which we need year round in our small-scale food premises. We only use manure from our own animals for biogas production. We have cut our energy consumption with more than 90 %. The biogas also provides excellent digestate which improves the fertility and value of our farmland.

We are a modern food company with its own unique life cycle. If you choose Wapnö, you are a climate conscious consumer that can be proud of your choice.

Wapnö is an open farm. Consumers are welcome year round to get a closer look at the animals, barns and dairy. In our restaurant our top-class chefs cook delicious food using fresh ingredients picked directly from our farm.



### **Background Information**

- Wapno Gard is an integrated farm
  - Milking, processing, retail store, biogas plant, hotel
- Using biogas for electricity, heat for dairy and buildings, cooling for milk and air conditioning
- Cooling is by an absorption process
- Heat from digester is also used to dry wheat
- In the hotel you can stay in rooms named after cows



- Daily food
- Own dairy
- Grow vegetables, wheat for bread
- Grow beef
- Nearness, freshness, and to be an open farm
- Open every day to public
- 60,000 visitors per year
- Grow food for animals
- Milk flows 30 m to processing plant – milk is fresh
- Deliver milk at 11:00 milked at 9:00
- Own brand
- Near produced = Local food
- Wapner = here produced



### Cow Information

- 1350 milking cows
- 2300 replacements
- 2X per day
- 60 stall rotary
- 240 cows per hour
- 32 litres per day
- 10 SEK/L (\$1.67 CDN/L)
- Cool milk, use heat for hotel and restaurant
- Milking heat – thought milk flowed in radiator

- Let the cows out to pasture every year on the same day at 11:00
- Done this for 17 years
- 6,000 people come to watch
- It is a real attraction
- They were the first to do it

### Biogas Plant

- First biogas system with absorption cooling system in the world
- Wasn't just for electricity
- Produces cooling for the dairy
- Started 8 years ago to think about a cooling machine – 2006
- Wanted to have -6 °C
- Experimented with different options – settled on ammonia, water and salt?
- Cool to -12 °C
- Built by a Danish company – said



impossible to do

- Two tank system
- Input is only separated solid manure
- Goes through a screw press to separate solids
- Not using any off-farm inputs
- Using a TMR mixer to input manure
- 2 weeks in first tank and then moves to next one
- Running at a temperature of 39 °C
- Producing 360 kW of electricity
- Mann engine
- All energy used on farm
- Reduced use of fossil fuels on the farm by 90 %
- \$4.2 million CDN investment into the biogas
- 30% of investment came from government funding
- 10-15 year ROI
- Use biogas to dry own grain on-site

### Feeding

- Corn only for young cattle never for milk cows – can't change the taste of the dairy products by adding corn (would make it sweet)
- Grass silage, whole crop silage, rapeseed main constituents of diet
- Dry forage and corn only for young stock



## Danish Dairy Industry

- There are currently 18,000 farms with cattle production in Denmark
- Cattle production is moving west with more than 85% of all cows being found, today, in Jutland
- The Danish cattle herd consists of about 1.6 million head of cattle, of which 580,000 are dairy cows, 670,000 heifers and 270,000 steers and bulls. There are also about 100,000 suckler cows (beef cattle breeds).
- The 3,700 dairy farms in Denmark supply in total as much milk as 141,000 herds did 50 years ago. And the trend towards fewer but larger herds continues
- A cow produces on average 25 litres of milk per day, compared with 12 litres per day 50 years ago. Jersey herds remain the largest with an average of 165 cows.
- The largest herd has about 1,600 cows. There are more than 40 herds with over 500 cows.
- An average herd produces 1.4 million litres of milk annually. 50% of dairy farms produce over 1 million litres of milk annually.
- There are more than 100 large specialized producers of veal calves in Denmark, each producing more than 300 calves annually. The farmers buy bull calves from dairy herds for fattening. The veal calves are slaughtered when they are between 9 and 10 months old.



2013. World Class Cattle Production, Danish Agriculture & Food Council, Cattle

### **Exports of dairy products account for more than 20 percent of all Danish agricultural exports.**

The Danish dairy industry consists of the international dairy group Arla Foods and 30 smaller dairy companies, together processing 4.7 billion kg milk from a total of 61 production plants in Denmark.

Cooperatively owned by Danish and Swedish milk producers, Arla Foods is Europe's largest dairy group. The Arla group processes more than 90 percent of the Danish and two thirds of the Swedish milk pool. It also runs dairy operations in a number of other countries, with Arla UK plc as its biggest business.

The remaining 30 Danish dairies are evenly distributed between cooperatively and privately owned companies. The small dairies typically specialize in various product areas within cheese, butter and liquid milk production. A large part of their production is exported by specialized exporters.

The value of all Danish dairy exports totals EUR 1.8 billion annually. The domestic market is, to a large extent, a market for domestic dairy production, although imported cheese and yogurt now account for approx. 25 percent and 20 percent, respectively, of total domestic consumption. The market share of foreign milk remains moderate.

Like the processing sector, the Danish milk producers have seen tremendous structural change, with production now taking place on a small number of large farms. In 2010, approx. 4,100 dairy farmers each had an average of 127 cows and a milk quota of 1,142 tonnes. This places the Danish dairy farmers among the largest and most modern in Europe. More than half the cows live in new loose-housing systems.

Exports of dairy products, in particular cheese, preserved milk products and butter, account for more than 20 percent of all Danish agricultural exports. The largest market for Danish dairy products is the other EU countries.

## **Friday August 22<sup>nd</sup> - Denmark**

### **Vejlskov Dairy**

Favrskovvej 265, Morsholt 8300 Odder, Denmark

[www.fremtidsgaarde.dk](http://www.fremtidsgaarde.dk)

Hans Jakob & Claus Fenger



500 cows and growing to 700, well managed dairy with 10 Lely robots, new slatted barn built in 2013 which is architecturally designed to fit the landscape. Retail on farm, deep bedded stalls with manure solids, acidifying manure to reduce ammonia emissions, plans to graze using grazeway gates.

Vejlskovgård holds 145 black-and-white dairy cows and a highly productive stock, producing 11,300 kg of milk per cow annually. They also produce 70 calves

annually, with an increase of 1,340 g daily. Hans Jakob Fenger is the third generation on the farm which is situated in a valley in scenic, hilly moraine land bordering on the Vejlskov forest in Mid-Jutland.

Vejlskovgård is solidly anchored in the local community and enjoys great respect. The property developer therefore attaches importance to the farm continuing to be accommodating and open, with a light and airy impression. The overall concept for the new project is to further develop the existing buildings on the farm. The concept can be described as a strengthening and extension of the qualities of the place. The proposal also

emphasises future-proofing of the buildings, making it possible to continue to extend production without losing sight of the overall concept.

The new building has been improved as regards the:

- operation of the milk production
- the size of the building
- the design of the roof.

The new, integrative yard and the areas immediately outside the new building have been optimised in terms of daily operations. Hans Jakob Fenger has designed a silo and slurry treatment, and has been enthusiastic about the planned solution from the outset. A future-proof environmental approval that meets future requirements for dairy cattle stock, is in place.



The construction of the new cow yard began in 2011, and in May 2012, 250 cows moved into their new home. After only two weeks in the new facilities, the cows are producing more milk than before. On 12 September 2012 the new cow yard was officially inaugurated. Everybody with an interest in the project was welcome to come and see the new yard and hear about the project. Nearly 2000 people visited Vejlskovgård on the opening day.

### **Background Information**

- Unique architectural design
- Had to move huge hill for the barn
- Very open design for visibility
- Protective fabric hangs from the peak at intervals for a fire break
- The dairy has a self-serve milk dispenser
- Customers come from town to pick up their milk and visit the cows
- Conventional not organic, so they don't have to pasture cows
- No pressure at present to switch
- A few years ago there was a debate, but it was turned down
- Economy not good for organic farmers
- Consumers don't want to pay more
- Asked if wanted to participate in an architectural competition for future dairy barns
- Extra costs were paid by a fund

- Idea was to build a model barn
- Very expensive to build – too expensive to copy
- 25M Danish Kroene
  - All included
- Idea also to build a barn inviting to the consumer to restore the link between the producer and consumer
- Learn about milk production
- At least 100 people through the barn every week – purchase milk, walk into the barn and see what is going on

### **Milking Barn**

- New barn constructed in 2012
- 170 cows on the other side of road – now 430
- Big step to more cows and robots



### **Milking System**

- 6 Lely Astronaut milking robots
- Room for another 2 units
- Transition to new barn and milking system went fairly smoothly
- Cows adjusted better than managers
- After 3 weeks 60 to 70% cows went by themselves
- Now only have to fetch 5%

### **Cows**

- 430 milking cows
- 33 kg per cow per day (ECM)
- 11,900 kg per cow per year
- 3.9% Fat, 3.38% Protein
- 250,000 SCC
- Cost of quota – 1 DKK/L (\$0.20 CDN/L)
- Penalized if over quota so milk less cows

### **Calf Management**

- Use Coloquick system for colostrum management  
<http://coloquick.com/>
- About \$4,000 USD



### **Manure System & Storage**

- Solids from the manure are separated and used for bedding
  - Roller press
- Bedding is distributed with an automatic delivery system
- Manure being treated with sulphuric acid to tie up ammonia

- JHacidificationNH<sub>4</sub><sup>+</sup> system
  - <http://jh-agro.com/manure-treatment/>
- Manure would have to be injected if not treated
  - Reduce the pH from 8.0 to 5.5
  - Convert ammonia to ammonium
  - Increase crop yield
  - 7 kg of acid per tonne of manure - 1 tonne of manure needs 7 kg of acid (\$0.20 CDN/kg of acid) = \$1.40 CDN/treated tonne of manure
  - System cost \$100,000 CDN
  - 4-6 years ROI depending on number of cows
  - Needed the ammonia reduction system due to the openness of the barn
  - Smells different, but still smells – hydrogen sulphide gas



### Land Base

- 250 ha
- Grass and corn
- Barley, wheat, and rapeseed as cash crops

### Danish Centre for Food and Agriculture

AU Foulum Tjele, Denmark

[http://dca.au.dk/en/about\\_dca/au-foulum/](http://dca.au.dk/en/about_dca/au-foulum/)

Foulum Research Station,  
Blichers Allé, Postbox 50,  
DK-8830 Tjele, Burrehøjvej 49, 8830 Tjele, Denmark

Merete Jensen

([Merete.Jensen@anis.au.dk](mailto:Merete.Jensen@anis.au.dk))



Contact – Morten Dam Rasmussen,  
Deputy Head of Department,  
Department of Engineering - Biological  
and Chemical Engineering,  
Blichers Allé 20, 8830 Tjele, Denmark,  
[mdr@eng.au.dk](mailto:mdr@eng.au.dk),  
Direct phone: 87157846, Mobile phone:  
25152755.

250 cows, 3 Delaval robots with Herd  
Navigator and SCC counter, hoof sprayer

and scales in robots, automatic bedding systems from JHministro, automatic calf feeders and colostrum system from Calvex.

- Two units – now Danish Cattle Research Centre
- Built and funded by farmer organizations
- Built in 2000
- More modern and more like a commercial dairy
- Able to monitor the cows in detail
- Research is funded partly by farmer organizations, partly by government, partly from research
- Need about 300 cows for experiments
- Special project for concentrating milk
- Running project with Alla
- Make a prototype
- Remove ½ water – less to transport
- Used for skim milk powder
- Have to use separate tank – need special permission

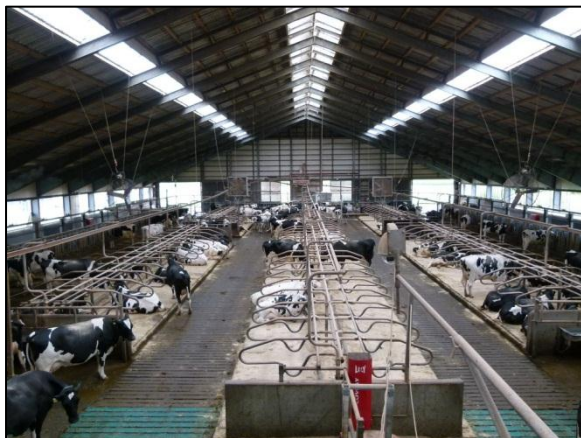


Peter Lovendahl discussed the projects going on related to the robotic milking system

- 3 DeLaval VMS
- New units more dependable
- More a research station than a dairy farm
- Need quality data for research
- Milk sampler Every milking, every day, seven days per week
  - Usually from Sunday afternoon to Tuesday afternoon
- Cell counter
- Third string goes into Herd Navigator

Platform discussion

- 3 groups of milking cows
  - One group is Jersey
- 4<sup>th</sup> heifers and dry cows
- Insentive feeding boxes
  - Up to 4 different rations in a group
- -10 to -15 °C for 2 to 3 weeks
  - Stays 2 to 4 °C in barn
- A little heat stress last summer
- Automatic bedding delivery
  - 3 to 5 times per day
  - Chopped straw



- Lely Discovery robotic slat cleaner
- Green slats (plastic covered) next to robot for comfort
- Unit for chopping and distributing large square bales in the dry cow barn



### Feeding

- 3 kg/day of robot pellet – not production based just to get them into the robot
- Weigh back robot pellets to measure feed intake – can also do preference trials on pellet ingredients
- Feed boxes allow for up to 4 different TMRs to be fed for trials – if cow goes to wrong box (wrong feed) then not allowed to get head in to eat
- Use milk replacer for calves (~50% of producers use milk replacer for calves – make more money selling the milk then feeding it to calves)
- Feed around 60% forage rations, 21 kg of dry matter, with 3 kg coming from robot

### Martin Riis Weisbjerg

- Marten discussed one main research project: “Impact of Salt Addition to a Barley Concentrate on Milking Frequency Milk Yield, and Feed Intake in AMS”
  - Milking frequency not affected by salt addition to barley concentrates fed in the milking robot
  - The data do not indicate positive effects of salt addition on cows’ preference for pelletized concentrates, in fact the amount of concentrate left in the robot, indicate that multiparous cows had a lower preference for barley with high content of salt
- Marten discussed other projects
- Feeding experiment to reduce fetching
  - Palatability of concentrates
  - Daily visits to robots
  - Able to measure what is left over in the robots
  - Fed at a rate that cow should eat it as fed out
  - Fed only 3 kg/cow per day in robot



## Peter Lovendahl

- Peter discussed one main research project: “Genetic variation in choice consistency for cows accessing automatic milking units”
  - Cows choose consistently – some more than others
  - Choice consistency is repeatable within lactation
  - Heritable effects are relatively small
  - Choice consistency cannot be ignored – but heritable part of variation is small
  - Is the permanent individual part indicating a learned behaviour?
- High or low flow rate cows have increased mastitis
  - Analyzed how cows were wasting time in robot
  - Time wasted did not correlate to mastitis
- Sometimes see cell count problems
- Carry over problems because of the way milk measured
  - Adjust electrodes
  - Some milk left in jar
- Another project – cow use of robot
  - Put equipment in a single robot on a multiple robot farm
  - Could not get average data
  - How stubborn are cows?
  - Some go to one, some other, some both
  - Some start with one and it gets to be a habit
  - Are we breeding stubborn cows?
    - It is not very heritable
- Different size groups
- All to do with robot availability
- The more fat in the milk, the slower they milk
  - Does choice consistency relate to other milking traits?



## **Kuhr Hedegård Dairy**

Rodkaersbro, Denmark  
Bredmosevej 31  
8840 Rodkaersbro, Denmark

Mr. Henry Kuhr Sr. and Mr. Michael Kuhr Jr.  
Micheal Kuhr is: + 45 204 91 222,  
Heine Kuhr is the one responsible in the  
company for the dairy.  
Phone +45 21613357,  
email is [rundstald@hotmail.com](mailto:rundstald@hotmail.com)



### **Background Information**

- 2 brothers
- Doing all field work by themselves with own machinery
- Third generation on this farm
- Built round barn around round rotary parlour
  - Started out with feeding boxes – concentrate and sugar beets
  - Idea was rotary to be a cafeteria
  - 300 cows originally

### **Cow Information**

- 500 dairy cows
- 10,100 kg / 22,266 lbs Average milk yield
  - 33 kg/cow/day
- 280 cows in high production group
- 120 in low production group

### **Milking System**

- GEA 60 stall internal rotary
- Original idea was to use the rotary for feeding



### **Milking Barn**

- Built in 2002
- 262 ft. (80 m) diameter
- 60 ft. (18 m) high
- An additional 9m was added to the outside for feeding – 2009
- Added 250 cows more
- Feed stalls
- No interference from Bodman when cleaning floors
- Reduce competition
- Stalls don't line up head to head, because the diameter changes in each row



- 480 free stalls in barn
- Bedded pack for dry cows and sick cows
- Room for 500 total
- 4.8m stall length

### Manure System & Storage

- Slatted floor
- Bodman sweeping system

### Feeding System & Storage

- Triomatic T40  
<http://www.trioliet.com/>
- Automatic feeding system with storage for silage blocks and bales
- 7 different TMRs fed 28x/day, runs 20 hours/day
- 2 dry cow, young heifers and 4 milk cow TMRs
- Stationary mixer for sugar beets, rapeseed, SBM, barley, molasses
- 6 feed floors with a length of 30 ft. (8.9 m)
- Fill kitchen (feed floors) – M, W, F
  - 3 hours to fill every day
  - 11 hours per week
- Trioliet block cutter – 105 cm deep – bigger block for system
- 2 to 2 ½ tonnes in one block
- Can put first and second cut in one table and third and fourth in another
- Block moves automatically forward
- Controls for concentrates and minerals
- Feeding robot with 110 ft<sup>3</sup> (3m<sup>3</sup>) capacity and 2 vertical mixing augers
- Feeding all cows with automatic system
- Been in for 6 years
- First system was put in 2006 in Holland
  - Belt changed to chain
  - Computer system upgraded
- 280,000 Euro for system (\$400,000 CAD)
- 4,500 Euro (\$6,500 CAD) for maintenance per year
- 1.5 cows per feed stall – use of “stalls” at feed bunk to reduce competition at bunk
- Feed more feed at the crossroad areas as more cows eat there
- Feed more grain but not more protein to fresh cows



### Land Base and Crop Management

- 1,150 acres (465 hectares)

## Saturday August 23<sup>rd</sup> - Denmark

### Nørupgård

Fynlundsvej 59, 6064 Jordrup

stald@noerupgaard.dk

Peter Christensen (son): +45 5157 9688

Asger Christensen (father and owner): +45 2020 8169



GEA rotary, 400 cows using the CowView global positioning technology in herd management.

**Owners:** Asger Christensen and Inge Schelde. The farm is in property of the Schelde family for 9 generations, since 1760.

Herds manager: Peter Christensen (son)

### Employees

Weekly management meeting at Wednesdays

8 people employed, 2 from Denmark, 6 from Rumania. The Danish are Herds manager and assistant herds manager, the Rumanian people do the more routine works (cleaning, milking etc).

Owners don't work so much at the dairy, Asger does a lot in politics.

### Cows

420 milking cows, milked 3 x a day (at 4 am, 12.30pm, 20.30 pm)

average milk yield is 11.200 ECM (4% fat, 3,4% protein). they actually produce 11.500 kg milk with 3,9% fat and 3,2% protein.

SCC at 160.000, lower in the wintertime, higher in the summertime

### Milking

50 places rotary GEA

in the morning milking herdsman is also milking and checking all the cows.

### Barn

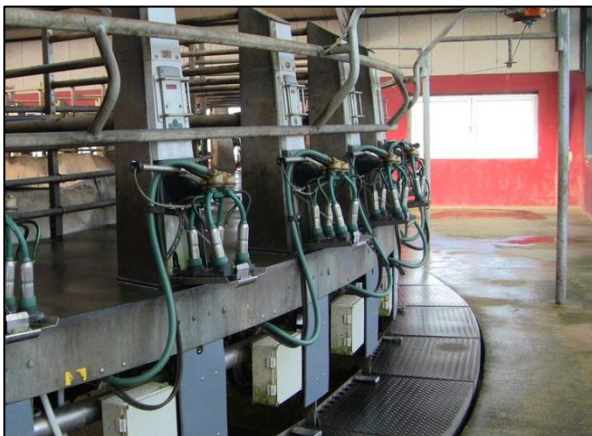
390 free stalls.

2 barns with 2 + 2 row free stalls and feeding lane in the center

barn 1: high yielding heifers + high yielding cows

barn 2: late lactating cows, fresh cows (20), high cell count cows, maternity (heifers and cows), hospital pen.

the barns are built in 2007



## Free Stalls

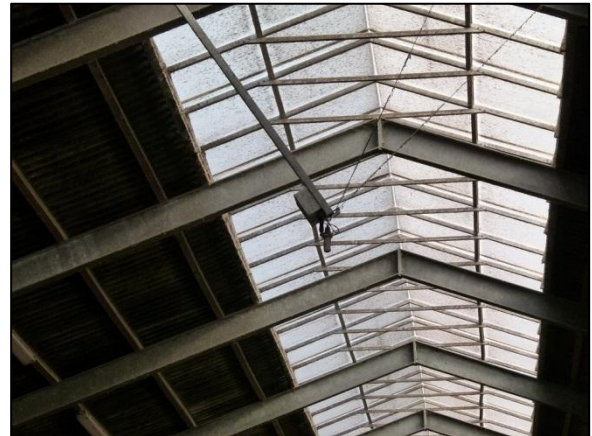
Free stalls with mattresses (2007) bedded 3 x day with a mixture of chopped straw (2/3), sawdust (1/3) and dried clay (disinfectant) bedding takes 3 x 20 minutes = 1 hour a day. In total there are 390 free stalls. bedding is done with a small machine (Bobman)

## Heat Detection

manual recognizing (see & hear), dairyplan, CowView

<http://www.gea-cowview.com/>

- Sensors placed around barn
- Tags on cows necks
- Used for 3 to 4 years
- Very satisfied with CowView – use it every day
- Big difference
  - Find cow very easy – she is a walking GPS
  - Activity – measuring how much time she is laying down, how much time she is walking, and how much time she is eating
  - Analyze and tell you when to breed
- Colour coded graphs for breeding
- See every cow and where she is located in the barn
- At this point you cannot detect whether she is standing or lying in the free stall
- Still very easy to see and use, but have a lot of information compared to activity measuring alone
- Spent 4 to 5% less time to find cows with CowView
- Can use for fresh cow management
- Can detect lame cows
- Pick the cow and then you can get all the detailed information
- High activity and low activity lists
- See what kind of behaviour has changed
  - Can check walking distance – time and frequency could be the same, but distance has changed – walking slower – lying longer in stall
  - Could be lame
- The cow is her own reference, because each cow is different





### Genetics and Breeding

Sexed semen to the best 50% of the cows and all heifers

Belgian Blue White to the cows in the lower end 25%

### Manure Handling

Scraping underneath the slats. collected in a channel in the end (under the driving alley to and from the milking parlor). in this channel the manure is mixed every day (15 – 30 minutes??). from there the

manure is pumped to one of the manure pits.

at the dairy there are 4 manure pits (3500 + 2500 + 2x2000m<sup>3</sup>) of in total 10.000 m<sup>3</sup>.

manure channels under the barns can store ca 1000 m<sup>2</sup> too.

they also rent storage of 5000m<sup>3</sup> at a neighbors farm.

### Feeding

Commodity barn for concentrate: boxes for: soya, canola and wheat treated in lye  
corn (maize): 2 x 14 x 50 m x 3 m walls + evt. the area east for the barn (now hutches)  
grass silage: 2 x 10 x 50m x 3 m walls

### Feed Delivery

TMR with 3 mixes for lactating cows (heifers high (more energy), elder high, late lactating (more roughage)) + 1 mix for the dry cows and 1 mix for the younger heifers.

Mixer wagon: Trioliet original 30m<sup>3</sup> but remodeled to 38 m<sup>3</sup>

in the morning at the early milking the cows are fed. in the day the feed is pushed 4 x.

### Ration

60% roughage, from which 2/3 maize (corn) and 1/3 grass silage

- Increased energy in ration this summer and saw an increase in production
- Feeds SBM, Rapeseed, wheat (mixed with water and caustic soda), fat and premix with 2/3 corn silage and 1/3 grass silage
- 60% forage diet, ration very wet
- Feed 3 kg of treated wheat per day
- Dry cows get 3 kg/d straw
- Calves get a lot of grass – counting on protein from grass

### Grouping:

fresh cows – high yielding heifers – high yielding elder cows – late lactating cows – cows with high cell count.

hospital barn

maternity heifers, maternity cows



### **Calf Management and Housing**

calf born, receives colostrum as quick as possible (not from the own dam, but from the last calving cow)

The colostrum is quality checked, good colostrum is for the heifers, not so good colostrum is for the bulls

The colostrum is kept in the refrigerator and warmed up by microwave.

The cows are first milked after 12 hours. the cow stay in the calving area until milking.

The calves are housed in solo hutches (50 in total) for 2 -3 weeks. Here they receive 3 x 3 liter milk. There are 5 group hutches too in which 4 calves each.

The bull calves are sold by 3 weeks age.

The heifer calves are moved to the “old barn”. Here they are housed until they are 8 months in deep litter (straw pack)

The calves receive 3 x 4 liter milk and are weaned by 100 kg (they check weight).  
(daily gain: outside: 1000 – 1100 g a day; inside 750 – 900 g a day)



### **Heifer Management**

After 8 months the heifers are housed in the old cowshed, in free stalls. here also are housed the dry cows. 350 stalls in total (100 stalls for dry cows and 250 stalls for heifers). Dry cows and pregnant heifers are moved to the maternity pen 3 weeks prior expected calving (freshening)

### **Land Base**

- 300 ha
- 150 ha rented
- Grass and corn
- Some wheat and barley

### **Wissingsminde**

6640 Lunderskov, Denmark  
Simon Simonsen

Wissingsminde is a modern farm with 250 Holstein-Friesen cows and 865 acres of land. Simon Simonsen started as a herd manager under his parents in 1999 and took over the farm in 2002. Today he and his 3 employees work full time on the farm. In 2012 the neighbouring 270 acre farm Mariegard was purchased. The Wissingsminde farmhouse was built in 1912.



- Use same routine every day
- Start the day by looking at the management lists
- Secret is the people who look after the cows

### **Cow Information**

- 250 milking cows
- 38.5 Kg/cow/day
- 12,000 kg per cow per year
- 3.9 fat
- 3.3 protein
- 210,000 SCC

### **Milking System**

- 4 Lely Astronaut milking robots
- Only one problem is alarms and maintenance costs
- Number 11 in Denmark with Holsteins



### **Milking Barn**

- The original dairy barn was built in 1976 and renovated in 2006
- In August 2009 the construction of the new barn started and in May 2010 the cows moved in
- 6 row barn with centre drive through
- Deep bedded sand bedded free stalls
- Hydraulic drawbridge for cross over



### **Manure System & Storage**

- Mechanical alley scraper
- Alley floors had rows of slots in the centre down to a square tube beneath the floor
- Manure scraped to end of barn to a holding tank
- The manure was then agitated and pumped to long term storage
- Sand for bedding in Denmark is much finer than the sand used in Ontario and as a result it can be agitated and transferred by pumping

### **Feeding System & Storage**

- Grain storage and mixing was in the existing barn
- Grain was transferred pneumatically
- Kuhn TMR mixer

### **Replacement Management**

- Calves raised in mobile pen units
- Transferred to group pens after weaning

### **Land Base and Crop Management**

- 865 acres (350ha)
  - Barley, wheat, rapeseed, grass, corn, alfalfa
- 40 acres of forest

### **Logumkloster**

Løgumklostervej 16,  
6780 Skærbæk, Denmark  
Tom Scholtens

With 270 cows in a fabric barn with green stall dividers, sand bedding, and feed stalls and green dividers along the manger, this dairy has made cow comfort their priority.



Lunch sponsored by CowWelfare and their Canadian distributor, iBarn will be at the farm. CowWelfare is the originator of the green free stall concept.

- Came from Holland in 2006
- 600 km from Amsterdam
- Started with 130 cows and 100 ha
- 3 years later bought a neighbour's land
- Now 175 ha - field work is done by custom operators
- 300 milking cows
- 100,000 SCC
- D12 parlour
- Viking genetics

### **Greenhouse Style Barn**

- Greenhouse style barn
  - Barn style from Holland
  - Built in 2012
  - Just like outside, but dry
  - Snow no problem for greenhouse
  - Greenhouse 20% cheaper than conventional barn
- Free stalls 1.3m for dry cow, 1.25m for milking cows



- Cows don't have any neck pain with this style of head rail
- Cow welfare is very important – cows feeling good – give milk
- Went up 5litres per cow per day in new barn
- 2X milking
- Cow dividers flexible
- CowWelfare free stalls
- <http://www.cow-welfare.com/en/>
- Close up cows on bedded pack
- Two groups
- One ration
- One group has computerized feeders
- Corn silage and straw for dry cows



### Manure Handling

- Slots in floor
  - Scraper on top and attached to paddle in tube underneath
  - Square tube under floor
- Agitate manure and sand and majority is pumped out
- Three manure storages – filled separately
- Sand is easy to get – very fine sand
- 20,000 Eur (\$29,200 CAD) for sand every year

### Land Stats

- \$20,000 – 30,000/ha land cost – if you can find it
- 70% of dairy farms are in Jutland – 30% the rest of Denmark



### Feeding

- Has feeding stations for cows >90 DIM – production based
- Milk cows get – corn silage, grass silage, soy, rapes, corn and molasses
- TMR very, very wet
- Dry Cows – mostly straw and corn silage

## **Bart Pelgrom**

Bjørnkærvej 5,  
6520 Tofthund, Denmark

He has just purchased this herd with both a 1 box and a 2 box SAC/Galaxy robot. Organic under previous ownership the herd is now conventional.

- Owned for 23 days
- Mastitis problems
- 2M dk from owner
  - 10% from bank
  - 60% from credit company
- Interest rate below 1%
- 30 yrs for 3%
- Working for 16 hours per day
- Friends helping, but only help on weekends
- Worked on farm when younger
- Home farm sold 8 years ago
- Has environmental permission to add more cows – he want to buy his limit before the permission expires
- Only have one year to do this
- Farms want to grow but don't have permission
- One farmer 50 km away has 100 cows for sale



## **Milking Cows**

- 200 cows
- 200 heifers
- 10,000 l per cow
- Plan to go to 11,000

## **Milking System**

- 3 robots SAC
- 2 people milking 200 cows
- He likes robots, but if he has more than 250 cows he won't use robots
- After quota is gone – get more cows
- Buy one robot more



## **Land Base**

- 200 ha
- Grass and corn
- Field work custom done

## Monday August 25<sup>th</sup> - Denmark

### Salsbjerggård Jersey

Togårdsvej 17, 4750 Lundby

Soren Madsen



630 cows, Jersey herd that are pastured New Zealand style, 32 swing parlor, high yielding herd, 10.000+ ecm (Danish, 4,2% fat + 3,4 % protein). Calving starts in June. All cows calve in a short period in the summer and get bred at the same time too. Cows are grazing in the summer and have a new big sand bedded barn too and a swing over parlor from New Zealand. They dig their own sand. In a benchmarking, they had the best economy result in Denmark on the cow side.

Cattle property "Salsbjerggård" at Taiping run by Soren Madsen, who is the second generation on the farm which his parents bought in 1967 Søren Madsen took over ownership in a gradual generation and has been the owner since 2005.

### Background

- Farm on top of a sandy hill
- Main business is dairy cows
- Milking 600 Jersey cows
- Father bought farm in 1967
- Started with pigs
- 1981 introduced quota system – milking 50 cows
- 1996 – milking 65 cows when Soren started
- European quota system – able to buy 50 tonne
- 2003 buy as much as wanted
- Environmental restrictions restrict expansion – limit number of cows
- Had 210 sows – raised free range pigs - had for 10 years
- Good for exercise - 2006 stopped
- 1999 built new cow shed and parlour
- 2001 built deep straw barn – clean twice per year
- Increased in 2010 to 400 from 85 (1999)
- Built two more barns 2010 & 2011
- 6 row sand barn with outside feeding
- Increased to 600 - room for 850
- Rome wasn't built in one day



- Grass only grows from middle of May to end of October
- Working 20 hours of day when calving
- Get in calf before daylight gets short
- Cows only outside in morning - only out for 4 or 5 hours

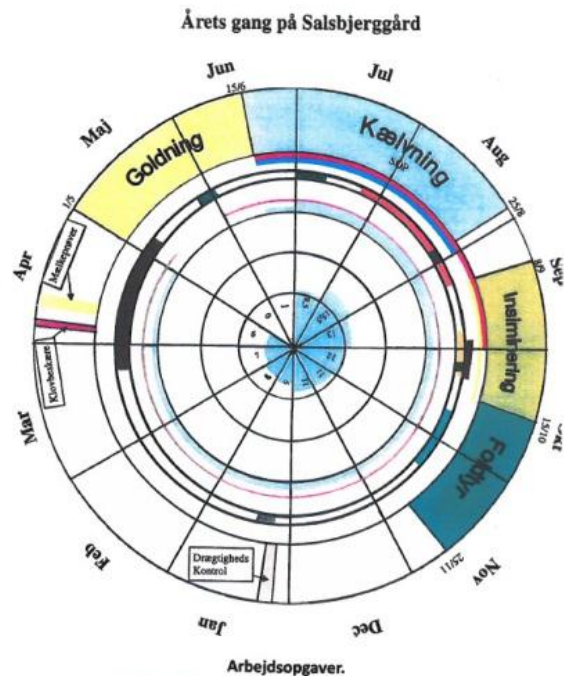
### Cows

- 600 high producing Jerseys
- 40 kg of milk per cow
- 4.20 fat, 3.4 protein
- 10,000 standard milk per week
- 5.4 fat and 4 protein
- Low at moment because just after calving
- Always been in top 5 dairy farms in Denmark
- Every cow not pregnant the 25<sup>th</sup> of November slaughter or sell
- Never buy cows – use own
- 24 cases of mastitis in 2013
- Low because of sand in free stalls
- SCC 140,000
- Milk fever more of a challenge – drench them
- Quota 150,000 DK Crown



### Seasonal Calving

- 1993 worked in New Zealand for a year when he was 18
- Loved the system there - brought ideas with him
- Took few years to make it work in Denmark
- 1996 came home
- 1998 started first dry period – used system ever since
- Grid wheel – explains their production cycle
  - Dry cows off 1<sup>st</sup> of May
  - Start calving the 15<sup>th</sup> of June
  - End of calving at end of August
  - Inseminate the first part of September
  - Heifers 3 weeks
  - Cows 5 to 6 weeks
  - Then let bulls out
  - Good time to spring
- Seasonal calving makes it easy to increase efficiency
  - Only one day to dry treat
  - Calving – very busy



- Summertime a lot of daylight
- Very busy for 9 weeks and then the job is done
- Strength of system
- 2 days for dehorning calves
- Dehorn 200 calves in 2 hours
- Like to work this way - busy then relax
- Only lost 2 calves this year
- Seasonal calving not a problem with processor as production is high from other farms when cows are dry
- Highest milk production in Denmark is Apr, May, June
- Lowest Oct, Nov, Dec
- Soren produces opposite to this

### **Milking Parlour**

- New Zealand style swing parlour
- 32 units
- Milking 600 cows in 3 hours
- 1999 went to look at parlour in New Zealand
- Brought builder back from New Zealand and they built it on the farm
- Milking routine
  - When cows come in spray with soap, dry with paper
  - When done spray teats instead of dipping because it takes less time
  - 2 people milking
  - Person A, Person B - more experienced
  - Person A sprays with soap half way down
  - Goes back starts cleaning
  - Person B starts putting machines on when all cows in
  - When 10 to 12 units are on they open door and cows start walking
  - Milking down to 32 when others walking out
  - Last cow wants to walk when milker is off
  - When last cow leaves it encourages the others to follow her in
- 25 turns x 32 units = 600 cows
- Important to have rhythm
- Most experienced milker stays in pit while other starts scraping
- Milk 100 cows per man per hour - as many as a rotary
- Very inexpensive
- Started with 16 swing
- Holding area for 450 cows



### **Feeding**

- High intensive feed
- High producing – feed soda wheat – sodium hydroxide
- Jersey cows not good at high feed if not high producing
- Feed soybean meal and canola meal for adjusting protein
- Very restricted feed plan
- Exactly the same every day
- Gradual changes – take month to make changes
- Follow rhythm
- Lower feed level after Christmas
- Feed cows where they are in lactation – all at same point
- Feed is biggest expense

### **Land Base**

- 400 ha of land
- Corn and grass for cows main crop
- 30 ha sugar beets
- 30 ha canola
- 25 ha of grass seed
- 50 ha barley
- 120 ha corn

### **Gjorslev Gods**

Christian Petersen  
Gjorslevvej 20, 4660  
Store Heddinge, Denmark  
[stalden@gjorslev.dk](mailto:stalden@gjorslev.dk)

300 cows, 14.100 kg of milk per cow with 3.7 and 3.25 fat/protein, milked in a 44 stall rotary parlor. All heifers and dry cows are on straw pack, and milking cows have sand free stalls remodelled from mattresses. The farm has a big old castle and many preserved old barns.



- Christian is the herd manager
- Started as herd manager in September 2009
- He was there when main barn was built in 2003
- Worked at Paul and Ellen MacLeods for one year
- 300 cows in pack barns before free stall barn was built
- Had low production – high SCC
- Unfortunately the new barn was built more for people and not cows
- Started with mattresses and shavings

- Since then put in fresh cow group and sand in free stalls
- October 2010 started milking 3x per day
- Before 9,500 kg now 15,000 kg
- 550 kg fat, 455 kg protein – high for Denmark
- Have only Danish workers - need good communication with employees
- 7 employees
- Working 37 hours per week – can get fine if over 37 hours
- 5 weeks of holidays – that is the law
- Have to print out a working schedule for inspectors
- Owners is 74 years old – owned farm for 42 years
- 900 ha of land
- 750 ha of forest
- The farm has a restaurant, and they rent 45 houses
- Also has a castle constructed in 1396
- 22 workers in all
- Soil is best in Denmark
- Harvest 10.2 tonne of wheat average
- Grow alfalfa
- Manure rules limit expansion
  - Need 1 ha per 0.7 Holstein cows
  - Can't spread manure on alfalfa
- 4<sup>th</sup> cut hay at present - good yields this year
- Milk price has dropped since April
- \$100 M Canadian dollars value of farm
- Milk production needs to be profitable
- If cows don't make money – better to grow wheat
- Employ students - like to come to work
- Try to make as good as possible for workers
- Never get more per hour than when hired
- One worker been there 14 years – new guy would get same pay
  - Christian does management talks
  - Problem is walking on two legs
  - Talking on management – picture of himself in mirror
  - Did I give them the right information
  - Be a good example



### **Cows**

- 300 cows - milking 278 cows
- 300 heifers
- 15,000 kg/cow/year
- Fat – 3.8%, Protein – 3.4%
- SCC 140,000 with sand bedding
- 2 to 3 mastitis cases per month
- Only lost one cow last year

### **Milking Barn**

- 5 row free stall barn with perimeter feeding
- Sand bedded free stalls
- Slatted floor with scrapers underneath



### **Milking Parlour**

- 44 stall SAC rotary parlour
- Only walk in stalls at milking time – then cows know that if a person is in there it's time to milk

### **Calf “Housing”**

- Calves had unique “housing”
- They had done poorly outside, so they had been moved into a straw shed
- Individual pens were built from bales
- Pens were back to back, so two calves could see each other



### **Reproduction**

- Start at 30 days fresh
- Breed at first heat
- Breed high producers at 30 days as well
- 367 average DIM
- Sell a lot of 2 year olds to England – last year 75
- Only use North American bulls
- People from England don't look at numbers
- 85 % management, 15% breeding
- Breed for type and conformation

## Gjorslev Castle

- 600 years old – built in 1396
- Same castle today with improvements to roof etc.
- A lot of expenses with historical buildings
- Rebuilding bridge over moat
- Every stone has to be replaced in same spot

<http://www.gjorslev.dk/>

<http://en.wikipedia.org/wiki/Gjorslev>

<http://www.visiteastdenmark.com/In-int/danmark/gjorslev-castle-gdk616878>



**Gjorslev** is a cruciform medieval castle located 17 km south-east of Køge, on the island of Zealand, in Denmark. Originally owned by the Bishop of Roskilde, it is considered one of the most well-preserved examples of Gothic secular architecture in Denmark.

Gjorslev was built in about 1400 by Peder Jensen Lodehat, Bishop of Roskilde. It remained in the possession of the Roskilde bishops until the Reformation which led to its confiscation in 1637. It was sold in

1540 and was then in the possession of changing owners until 1678 when it came under the Crown once again. It was then owned by the Lindencrone family from 1763 to 1791, from 1793 to 1923 by the Scavenius family, and from 1925 and until the present day it has been in the possession of the Tesdorpf family.

Gjorslev is surrounded by moats and built to a cruciform design in the Gothic style. The building materials are a combination of local limestone from the Cliffs of Stevns and large bricks (Danish "monk stones").

The central tower is just under 30 m tall and has seven storeys. The south arm of the cross is slightly longer than the other three. A lower north wing was added in 1638.



## Tuesday August 26<sup>th</sup> - Iceland

On Tuesday the group left for their homes with 39 members stopping over in the Iceland for a whirlwind tour. Although no dairy farms were visited in Iceland the group did learn some facts about the dairy industry there.

- Number of dairy farms: 605
- Number of AMS farms: 140 - no. of AMS's: 147 (some few double installations)
- Number of DeLaval: 144 (+2 that will be delivered this autumn)
- No. of cows per farm: 45
- Total milk produced per year in Iceland: 133 million liters



### Cows

- Special breed for Iceland no import of cows are allowed.
- Cows came to Iceland from Norway in year 900 and have not developed much since then. That is also why the production per cow is quite low.
- There is now an ongoing discussion about the import of embryos from the Norwegian Red Cattle (NRF).
- Lack of milk at the moment, the quota system is not in use at present and the dairy farmers are producing as much as possible.
- Quota system will be started again in 2015.
- Not much production of grain,
- Only barley approximately 15,000 tons per year, because of short summer.
- Mainly grass production as well.



### Blue Lagoon

<http://www.bluelagoon.com/>

The Blue Lagoon geothermal spa is one of the most visited attractions in Iceland. The spa is located in a lava field in Grindavík on the Reykjanes Peninsula, southwestern Iceland. Bláa lónið is situated approximately 20 km from the Keflavík International Airport and 39 km from the capital city of Reykjavík. That is roughly a 20 minute drive from the airport and a 40

minute drive from Reykjavík. The Blue Lagoon spa and geothermal complex is clearly visible from any of the usual satellite imagery sources at coordinates.

### **Reykjavik**

<http://www.visitreykjavik.is/>



There are many fascinating things that make the capital of Iceland an attractive destination, with plenty of landmarks and places of historical significance to explore; however, there's always something new for the traveler to experience in Reykjavík too, and with every season revealing a new perspective of nature and countless different aspects of our colourful culture, it's difficult not to be impressed with the diversity of our tiny, but tremendously popular, city.

The appealing qualities that make Reykjavík such an irresistible hot-spot are both economic and aesthetic in nature. Apart from a diversity of famous festivals, attracting thousands of guests to the city each year, the fact that Reykjavik is now an “affordable destination” is often quoted as a major tourist incentive, together with being “cool on many levels” with plenty of “urban drama” and culture to match the surrounding magnificent landscapes and natural wonders.

## **Wednesday August 27<sup>th</sup> - Iceland**

### **Thingvellir National Park**

<http://thingvellir.is/english.aspx>

No single place epitomizes the history of Iceland and the Icelandic nation better than Þingvellir by the river Öxará. At Þingvellir - literally "Parliament Plains" - the Alþingi general assembly was established around 930 and continued to convene there until 1798. Major events in the history of Iceland have taken place at Þingvellir and therefore the place is held in high esteem by all Icelanders. Today Þingvellir is a protected national shrine.

According to the law, passed in 1928, the protected area shall always be the property of the Icelandic nation, under the preservation of the Alþingi.



In the last few decades, research has made it clear that Þingvellir is a natural wonder on an international scale, with the geologic history and the biosystem of Lake Þingvallavatn forming a unique entity, a magnificent showcase.

The Þingvellir area is part of a fissure zone running through Iceland, being situated on the tectonic plate boundaries of the Mid-Atlantic Ridge.

The faults and fissures of the area make evident the rifting of the earth's crust.

## Geysir

<http://en.wikipedia.org/wiki/Geysir>

The nearby geyser Strokkur erupts much more frequently than Geysir, erupting to heights of up to 30 metres every few minutes. Strokkur's activity has also been affected by earthquakes, although to a lesser extent than the Great Geysir. Due to its eruption frequency, online photos and videos of Strokkur are regularly mislabeled as depicting Geysir. There are around thirty much smaller geysers and hot pools in the area, including one called Litli Geysir ('Little Geysir').

Descriptions of the Great Geysir and Strokkur have been given in many travel guides to Iceland published from the 18th century onwards.



## Gullfoss

<http://en.wikipedia.org/wiki/Gullfoss>



Gullfoss is a [waterfall](#) located in the [canyon](#) of [Hvítá](#) river in southwest [Iceland](#).

It is one of the most popular tourist attractions in Iceland. The wide Hvítá rushes southward. About a kilometre above the falls it turns sharply to the right and flows down into a wide curved three-step "staircase" and then abruptly plunges in two stages (11 m and 21 m) into a crevice 32 m (105 ft) deep. The crevice, about 20 m (60 ft) wide, and 2.5 km in

length, extends perpendicular to the flow of the river. The average amount of water running over this waterfall is 140 m<sup>3</sup>/s in the summertime and 80 m<sup>3</sup>/s in the wintertime. The highest flood measured was 2000 m<sup>3</sup>/s.

As one first approaches the falls, the crevice is obscured from view, so that it appears that a mighty river simply vanishes into the earth.

### **Friðheimar Greenhouse and Horse Show**

<http://www.fridheimar.is/en>

Ever since they moved to Friðheimar, Knútur and Helena have specialised in cultivating tomatoes. They are keen to increase diversity in the Icelandic tomato market, and have introduced new cultivars from time to time. They were the first growers, for instance, to cultivate plum tomatoes and Flavorino cocktail tomatoes in Iceland on a year-round basis. Most recently they have introduced the delicious Piccolo tomato. At Friðheimar, the principle has been to grow tomatoes with optimum taste quality, while maintaining eco-friendly standards. The tomatoes are now grown all year, using state-of-the-art technology in an environmentally-friendly way. Green energy, pure water and biological pest controls make for tasty and healthful tomatoes. Cucumbers have also been cultivated at Friðheimar since 2011.



Horses have been bred at Friðheimar since 1995, and the stud now has six first-prize brood mares. Seven horses have been shown at breeding evaluations, of which three received first prize – an overall score of 8.0 or higher. The stud is now raising some very promising colts – and our mares are only bred with prize-winning stallions.



Horse breeding is a long-term business, but now each year two or three promising youngsters are ready to start training. Friðheimar owns a total of about forty horses.

## Thursday August 28<sup>th</sup> - Iceland

The remainder of the group returned home from Iceland on the 28<sup>th</sup>. It was an amazing study tour with lots of information on the Scandinavian dairy industry, but also lots of local history and incredible scenery.

