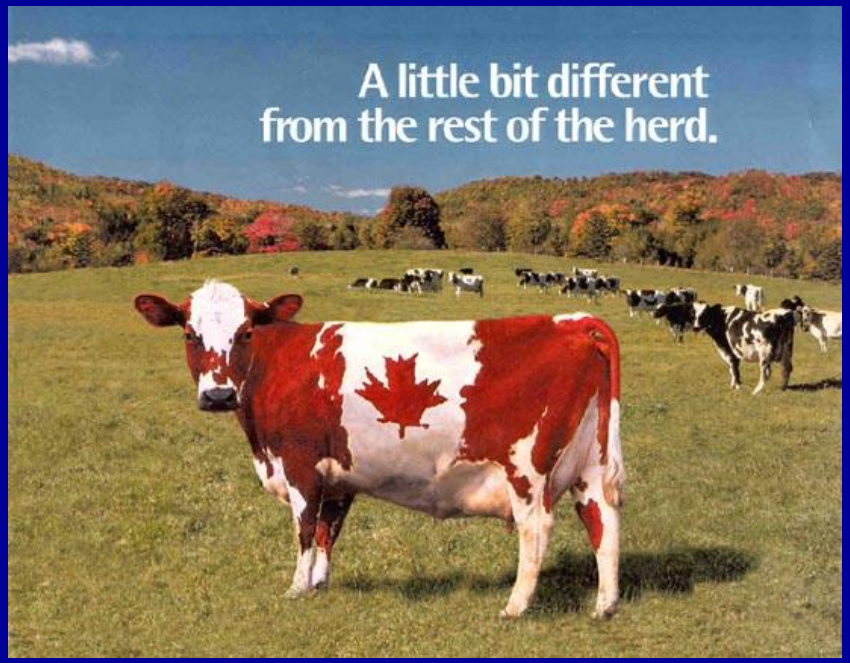
Larenwood Farms Ltd.

Chris McLaren



Outline

- Farm history
- Why build new facilities
- Major building decisions
- Bedding choice
- Tour new barn
- Costs and changes with sand

History

- Chris, Grant and Dan McLaren
- Built 1860
- 5th generation

- 95 milking cows
- 500 acres (200 hectare)

McLaren Family

Five Years ago

Production Preconstruction

- 34 litres per cow per day
- 305 milk: 10500 kg
- Milk value $6964/cow/year
- Pregnancy rate of 18%
- Somatic Cell Count of 140,000
- 41% lactation 3+

Feed Mixing

Why Build

- Cows limited in current barn
  - Older cow production below industry averages
    - mastitis in older cows
- Position operation for future expansion
  - Post quota?
- Cow comfort and animal welfare

Why Build

- One man able to catch cows and milk if necessary
- Meet the genetic potential of the cows
- Keep more older cows
- New technologies
- Attractive barn for years to come
  - Attract employees and education of neighbours

afimilk®
The Heart of the Dairy Farm

Design Process

- Need to answer a few important questions before we build a new barn

1) Feed Storage
2) Milking system
3) Bedding type

Design process

- Tours, conferences and workshops

Tour Locally

Tour Internationally

Design Process

- Advice from producers
  - Contractors, equipment suppliers and process
- Open houses

Design Process

- Consultants to look at plans
- Equipment supplier helped initially

Design Process

- Need to answer a few important questions before we build a new barn

1) Feed Storage
2) Milking system - Robot , parlour or tiestall
3) Bedding type

Feed Storage Decision

Feed Storage

- Decided on bunkers
  - Lower initial cost compared to silo
  - No repair bills
  - Little rodent damage
  - Ease of expansion
  - Land was available

Milking System

Milking System Decision

- Decided on parlour
  - More flexible expansion
    - Initial investment is good for many more cows
  - Can milk cows fast
  - Scheduled milking fits me better
  - Can have as much technology as other systems
  - Enjoy milking cows

Bedding Decision

- Mattress
  - Low labour
  - Manure handling easy
  - High cost to build
  - Leg injuries

Bedding Decision

- Deep bedded straw
  - Cow comfort
  - Low cost barn
  - High labour

Bedding Decision

- Deep bedded sand

Why Sand?

- Mastitis
  - Sand limits bacterial growth because it is inorganic

↓ Mastitis ↑ Milk production

  - Cost of mastitis
    - Lactation loss of 120kg (Rajala-Schultz et al, 1999)
    - $100 or more per case (Sischo et al, 1990)

Why Sand?

- Hoof Health
  - Sand keeps feet dry
    - Reduce risk of infectious causes of lameness

↓ Lameness ↑ Milk production

  - Cost of lameness
    - More than 1 kg/cow/day (Warnick et al, 2001)
    - $200 or more per case (Guard, 1994)

Why Sand?

- Traction on floor
  - Less slipping and risk of injury
- Comfort
  - Old cows can get up
  - increase lying time
- Keep older cows

Sand Barn Design

- Deep bedded or stall base?
  - Deep bedded
    - Increased comfort
    - Cleaner cows

Sand Barn Design

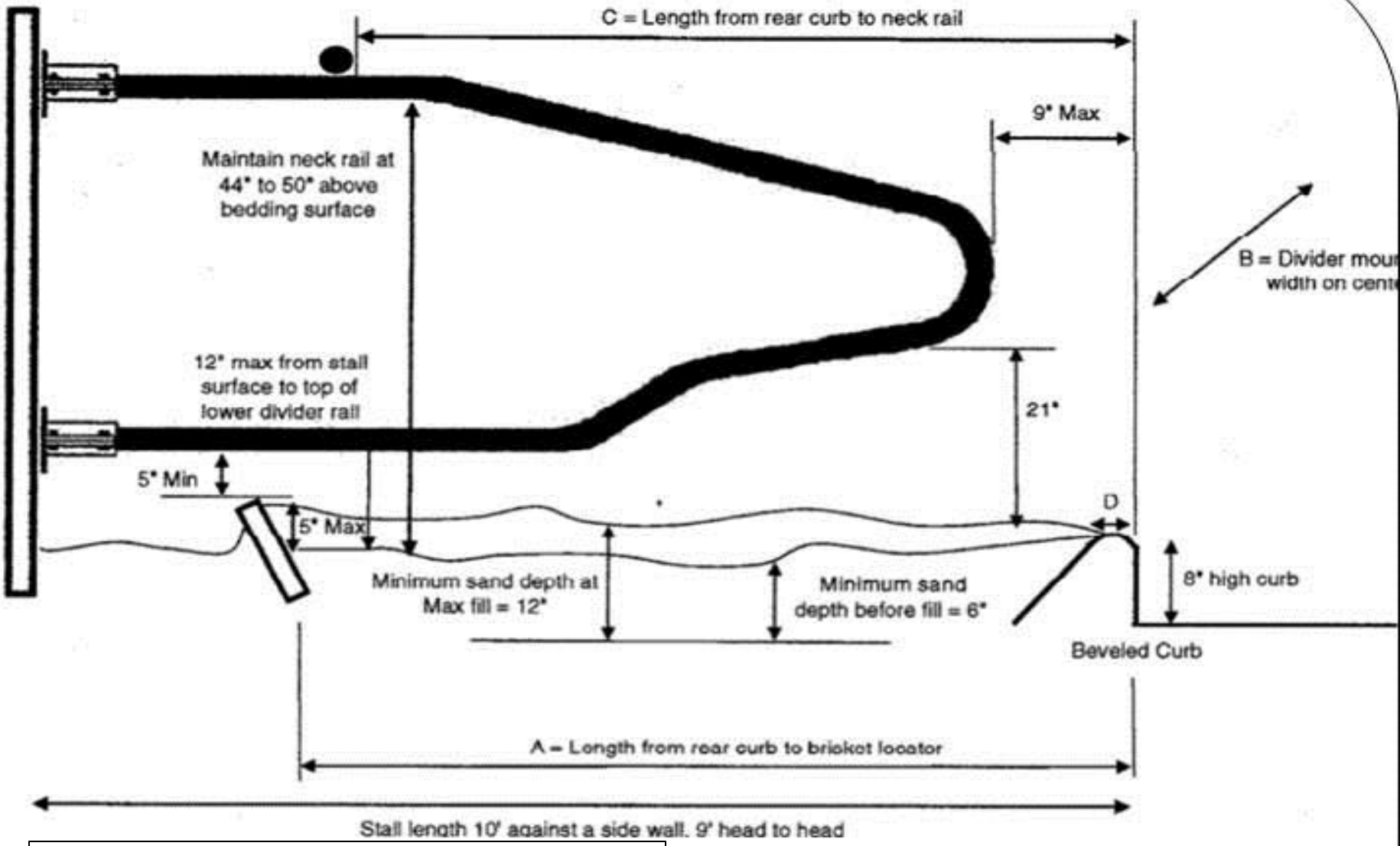
- If base in stall is required
  - Deep bed with cement base
    - 2 feet (60cm) or more
  - Pack mat
    - Mattress under sand

Sand Barn Design

- Stall dimensions
  - Size of cows and breed
  - Ours are large Canadian Holstein cows
    - 48 inches wide (120cm)
    - 8 ½ feet long (260cm)

Sand Barn Design

- Sand level changes daily
  - Neck rail positioning
    - Used recommended measurements for stalls
  - Curb at back of stall on an angle
    - Comfort



Group	A	B	C
First Lactation	70 (178cm)	48 (122cm)	A-D
Mature cow	72 (183cm)	50 (127cm)	A-D
Pre-fresh mature	72 (183cm)	54 (137cm)	A-D

Ontario Ministry of Agriculture Food and Rural Affairs, Freestall housing manual 2009

Sand Barn Design

- Brisket board?
  - Yes
    - Index cows and keep bed cleaner

  - No
    - More comfort and resting time
    - Can dig trapped cows out
    - More manure in stalls

Sand Barn Design

- Hoop style
  - Many types
    - Want one that contours to cattle body
    - Freedom for front and side lunging
    - Cow can stretch and lay comfortably

Sand Barn Design

- Cleaning floors
  - Skid steer
    - Low cost
    - High labour
    - Dirtier cows

Sand Barn Design

- Cleaning floors
  - Automatic scrapers
    - Low labour
    - Cleaner cows
    - High repair cost with sand
    - Cable or chain

Sand Barn Design

- Chain or cable scraper
  - Cable
    - Smaller cut in floor and easier on cattle feet
    - Rubber coated cable
      - Resist wear and rust
    - Cut groove for cable
      - No rough edges

Sand Barn Design

Sand Barn Design

- Manure system
  - Reuse??
    - Settling lane or mechanical
  - High cost/ high labour

Sand Barn Design

- Pump sand?
  - Pipe plugs (must air blow daily)
  - High cost to build
  - Wear pump

Sand Barn Design

- Keep it SIMPLE
  - Gravity through pipe?
    - BUT can plug

Sand Barn Design

- Keep it SIMPLE
  - Just dump manure into pit

Sand Barn Design

Sand Barn Design

- Dump it in pit

Sand Barn Design

- Winterize gutter

Sand Barn Design

- Access for repair

Sand Barn Design

- Cows expect sand traction everywhere
  - areas with out sand beds a problem

Sand Barn Design

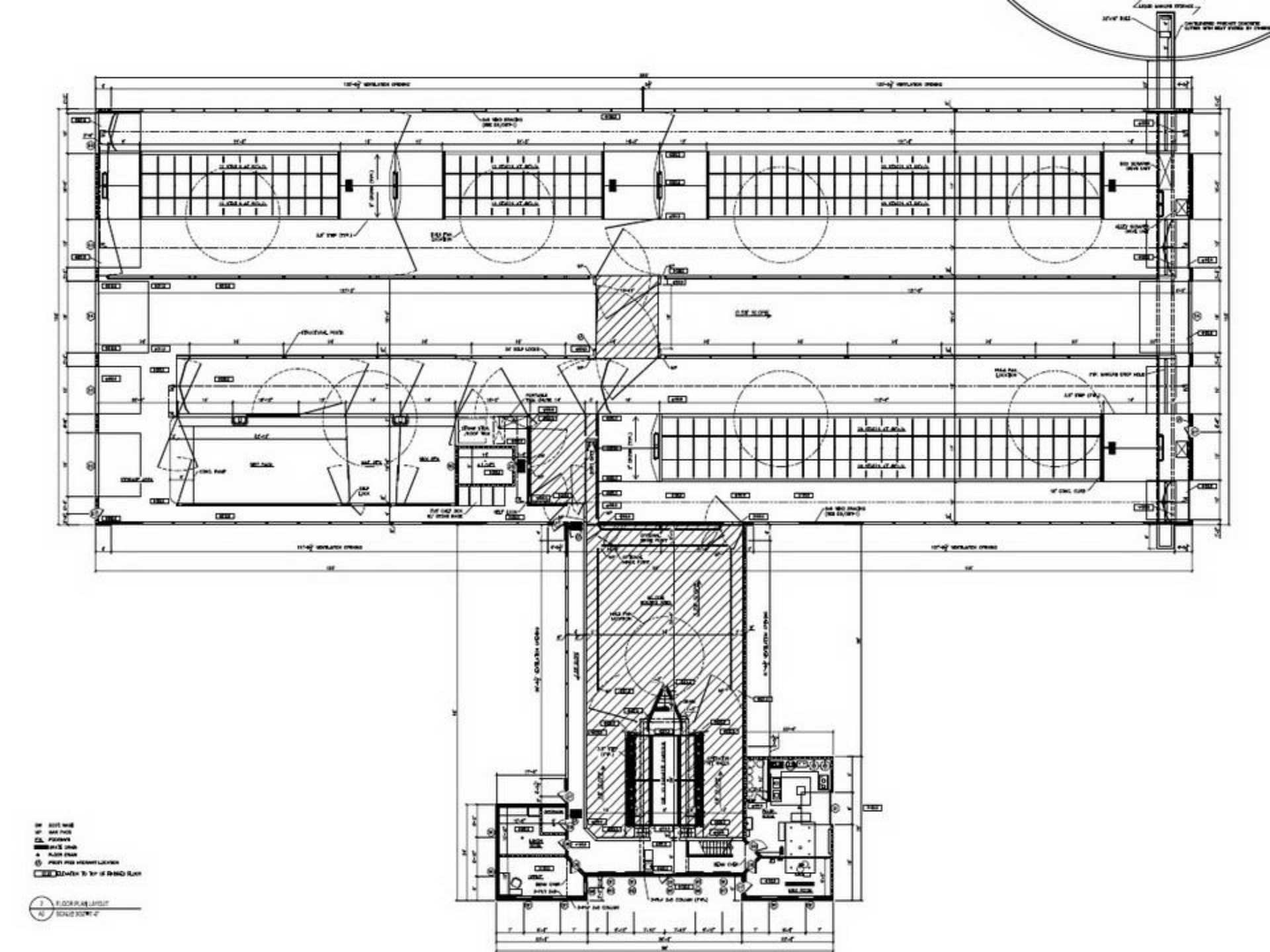
- Extra weight on scraper near stall
  - Uneven wear on scraper parts

Construction

- Decided to go ahead with building a barn in the spring of 2011
- Get started early in spring

Barn Details

- 150 stall barn
  - 126 milking and 24 dry
- Sand bedding
- Three groups of milking cows (fresh, heifer, and mature)
- Double 10 vertical lift parallel parlour
  - Afimilk
- Sort gate



Barn Tour

- Some pictures of the construction process
- Visual tour of the completed facilities


KOMATSU


Dufferin
Concrete


DeLaval


GEA
Houle

GEA

Moving the Herd

- Preparing the herd for the move
  - Breeding for ``freestall`` cows
  - Built the herd slowly over 5 years to maximize the facilities we had and maintain closed herd
  - Enter cow information into computer system prior to move

- Moved the cows February 1st 2012

Moving the Herd

- Cement
  - Let it cure
  - Choose proper floor finish (we chose light “darby” finish)
  - Groove it
- Walk barn floors in light foot wear
  - Look for any abrasive surfaces
- Move heifers and dry cows into barn for weeks prior to the milking cows moving
  - Create a familiar smell in the barn and parlour

Moving the Herd

- Moving cows into sand bedding
  - Do not trim cows (only lame) no sooner than 6 months pre move (maximize hoof size)
  - Choose fine sand (less abrasive)
  - Calm cows as quickly as possible when moved
  - Remove all cows in heat from group

Sand

- Add sand every other week
  - Beach sand (soft and no stones)
  - $10 per 1000kg delivered
    - $8000/year (€5685)
  - If reusing it then need a bit larger grain

Costs of Sand

- Daily cleaning of stalls and leveling
  - Level beds at each milking
  - 2 hours per day

Sand

- Regular repair of scrapers
  - Shoes and wheels
  - Cable and blade

- Regular prevention
  - Oil cable
  - Grease moving parts
  - Even sand weight on floor

Maintenance Costs

- Changes
  - Length of barn, number of cows, season and number of scrapings per day
- Average yearly cost
  - $2700 (€1919)

Sand and Winter

- Gutter can freeze
  - Even with heat lines in walls
  - -20°C or more

Sand and Winter

- Gutter freezes
  - Cover hole and shut off
    - Scrape morning and night

Cost for Heater

- $500/month in electricity
  - $0.125/kwh
  - November to March
  - 5 x $500 =
    $2500/year (€1777)

Manure System and Winter

- Large amounts of straw from straw pen can pile and freeze

Manure

- Pump liquid out (spring and fall)
- Dig sand out (fall)

Sand Removal Cost

- Pump liquid ourselves
- Sand removal
  - Excavator and spreader hired
  - $250/hour X 12 hours = $3000/year (€2132)

Would I use sand again?

- **YES**

- Increases in
  - Age
  - Health
  - Milk production

Moving the Herd

- Heifers increased production immediately (2 kg per day in the first week)
- Mature group took a few months but went up same amount
- Slow progression from 34kg to current production

Current Production

- 305 milk: 14,856 kg
- 46 litres per cow per day (twice daily)
- Milk value of $10544/cow/year
- SCC: 80,000
- 22% pregnancy rate
- 50% lactation 3+

Change in Herd

	Old Barn	New Barn	Change
SCC	140,000	80,000	-60,000
Lactation 3+	41%	50%	+9%
305 Milk (kg)	10500	14856	+4356
Milk Value (per cow)	$6964	$10544	+$3580

Does Sand Pay?

- Costs
  - Bedding, removal, electricity and maintenance
    - $8000+$3000+$2500+$2700 =

      $16,200/year (€11 519)

- Added income (sand had large role)
  - Increase in milk value per cow per year
    - Older cows and lower SCC
    - $3580 per cow per year X 95 cows =

      $340,000 (€241,769)

Current Operation

- Top Canadian Dairy Herd Improvement (DHI) herd 2015
  - Scoring system
    - Milk production
    - SCC
    - Age at first calving
    - Calving interval
    - Longevity
    - % of herd milking

2015 Management Centre (Based on 2015 Herd Averages)

CANADA DHI HERDS

MANAGEMENT CENTRE	PERCENTILES									
	MAX	90TH	80TH	70TH	60TH	50TH	40TH	30TH	20TH	10TH
Milk Value: Holstein Average of Current 305 Day Lactations*	>$9,640	$8,029	$7,633	$7,375	$7,145	$6,910	$6,671	$6,406	$6,071	$5,548
SCORE	**500**	**451**	**401**	**351**	**301**	**251**	**201**	**151**	**101**	**51**
Milk Value: Non-Holstein Average of Current 305 Day Lactations*	>$8,579	$6,819	$6,405	$6,083	$5,874	$5,651	$5,448	$5,199	$4,911	$4,423
SCORE	**500**	**450**	**400**	**350**	**301**	**251**	**201**	**150**	**100**	**50**
Udder Health Herd Average Linear Score	<1.6	2.0	2.2	2.4	2.5	2.6	2.8	2.9	3.1	3.3
SCORE	**150**	**141**	**129**	**111**	**98**	**87**	**62**	**51**	**32**	**18**
Age at First Calving First Lactation (months)	<22.9	24.0	24.6	25.0	25.4	25.8	26.2	26.8	27.6	29.1
SCORE	**100**	**91**	**81**	**71**	**61**	**51**	**41**	**31**	**21**	**11**
Calving Interval Herd Average (months)	<13.2	12.8	13.1	13.2	13.4	13.7	13.9	14.2	14.5	15.1
SCORE	**50**	**50**	**50**	**45**	**39**	**32**	**26**	**19**	**13**	**7**
Longevity Annual Herd 3rd+Lactations	49.1% - 55.0%	49.9%	45.5%	42.7%	40.2%	38.1%	36.1%	33.9%	31.3%	27.6%
SCORE	**100**	**100**	**92**	**78**	**64**	**52**	**41**	**30**	**20**	**10**
Herd Efficiency Average Herd in Milk	86.4% - 89.3%	90.5%	89.4%	88.6%	87.9%	87.2%	86.5%	85.5%	84.1%	81.7%
SCORE	**100**	**74**	**98**	**100**	**100**	**100**	**100**	**76**	**51**	**26**

* Value after deductions/transportation

HOW PERCENTILES WORK: If all herds/animals were arranged in order from lowest to highest, the 75th percentile would be the value of the herd that is better than 75% of all the other herds. The 99th percentile value is that which is better than 99% of all the other herds.

Current Health of Herd

- DA 2-5%
- RP 2%
- Ketosis 10-15%
- Mastitis 5%
  - Mostly mild ecoli
- Lameness 5%

Herd Management Philosophy

High producing dairy cow is an athlete

- Good genetics
- Good environment
- Good nutrition
- Good management
- Prevention and monitoring
  - Maximize peak milk and DMI

Future Goals

- Continue to breed for a high type, high production herd that is trouble free
- Build heifer barn
- 3x/day milking

SEMEX®
Genetics for Life®

Holstein Canada

Future Goals

- Automate Feed pushing
- Prevent gutter from freezing
  - Automatic door on hole
  - Fan from barn to gutter


Larenwood Farms Ltd.
Aug. 2013

More Information

- Contact me:
  - larenwood@gmail.com

100% CANADIAN MILK™

Thanks

Thanks

Questions