

# Bedding Options: Having Another Look

Jack Rodenburg,



# WHAT DOES THE CUSTOMER WANT ??



## A Comfortable Place to Rest

- Adequate resting times.....12 to 14 hours?
- Minimal Bruising, Abrasion and Injury
- Stays Clean and Dry, min. bacterial growth

# The Cow Likes Lots of Bedding

Tucker and Weary, J. Dairy Sc. 2004, p2889

Mattress stall with	<u>0</u>	<u>1</u>	<u>7.5</u> Kg sawdust
Lying time (hrs.)	12.3	12.5	13.8
Lying bouts	8.5	9.3	10.1

# The Cow Likes Dry Bedding

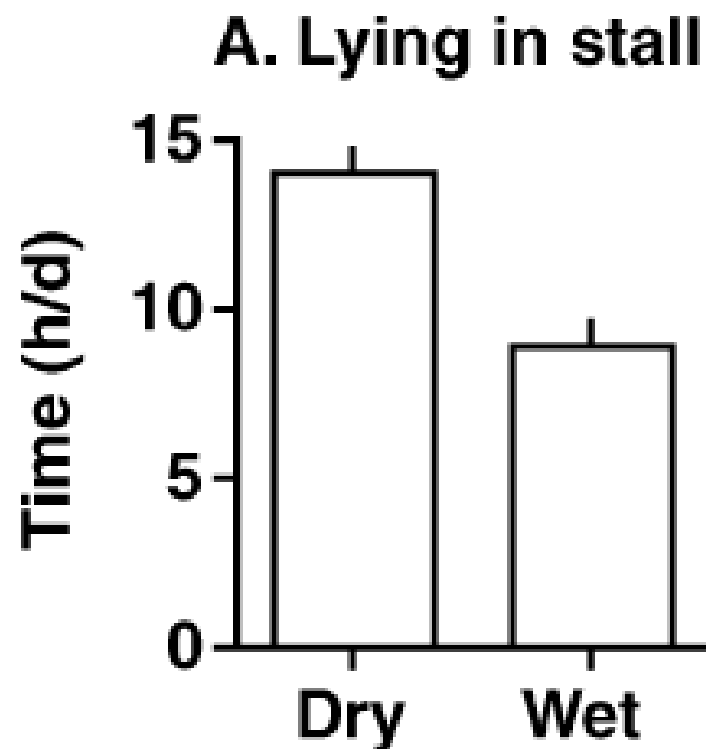
J. Dairy Sci. 90:5468–5472

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## Effects of Bedding Quality on Lying Behavior of Dairy Cows

J. A. Fregonesi,<sup>\*1</sup> D. M. Veira,<sup>†</sup> M. A. G. von Keyserlingk,<sup>\*</sup> and D. M. Weary<sup>\*2</sup>



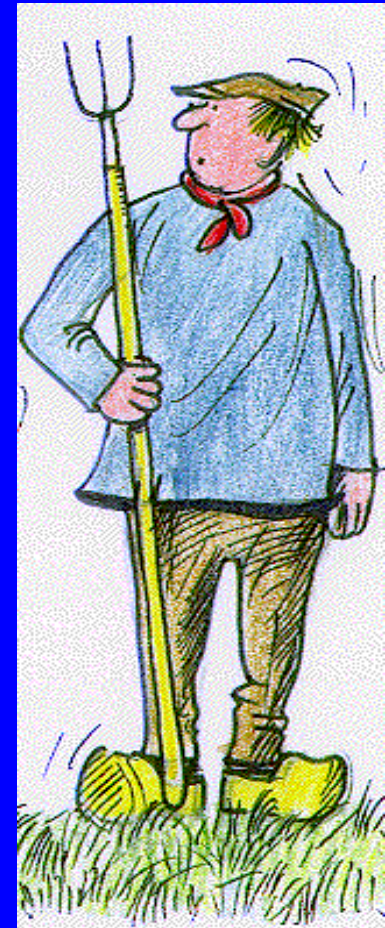




UBC Research, Dan Weary

# WHAT DOES THE CUSTOMER WANT ??

- Low cost
- Minimal labour
- Trouble free manure handling
- Healthy productive cows

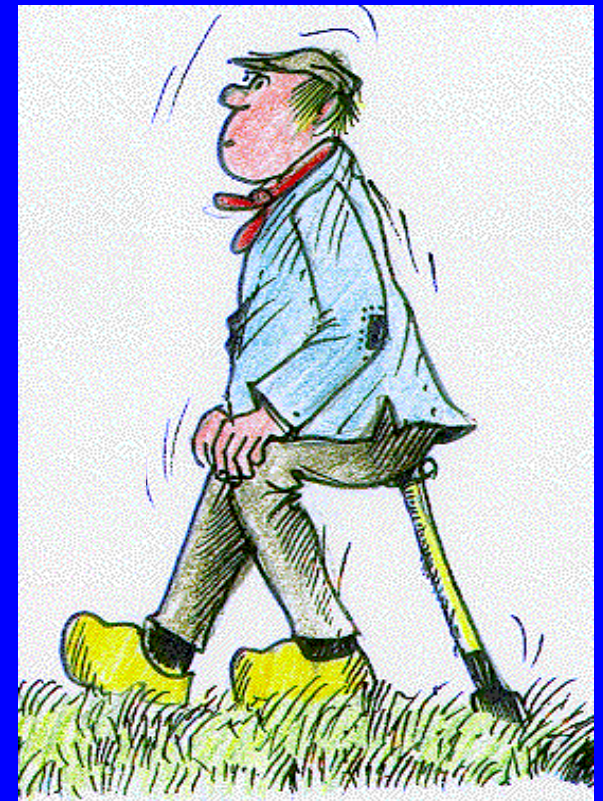




- Sawdust and shavings are not available !  
.....or they are too expensive

- This problem will not go away
- If it burns it will get more expensive

- Straw comes from cereals and I want to grow corn !
- Large amounts of bedding don't work in my manure system !







# Exploring Practical Bedding Alternatives

Jack Rodenburg,



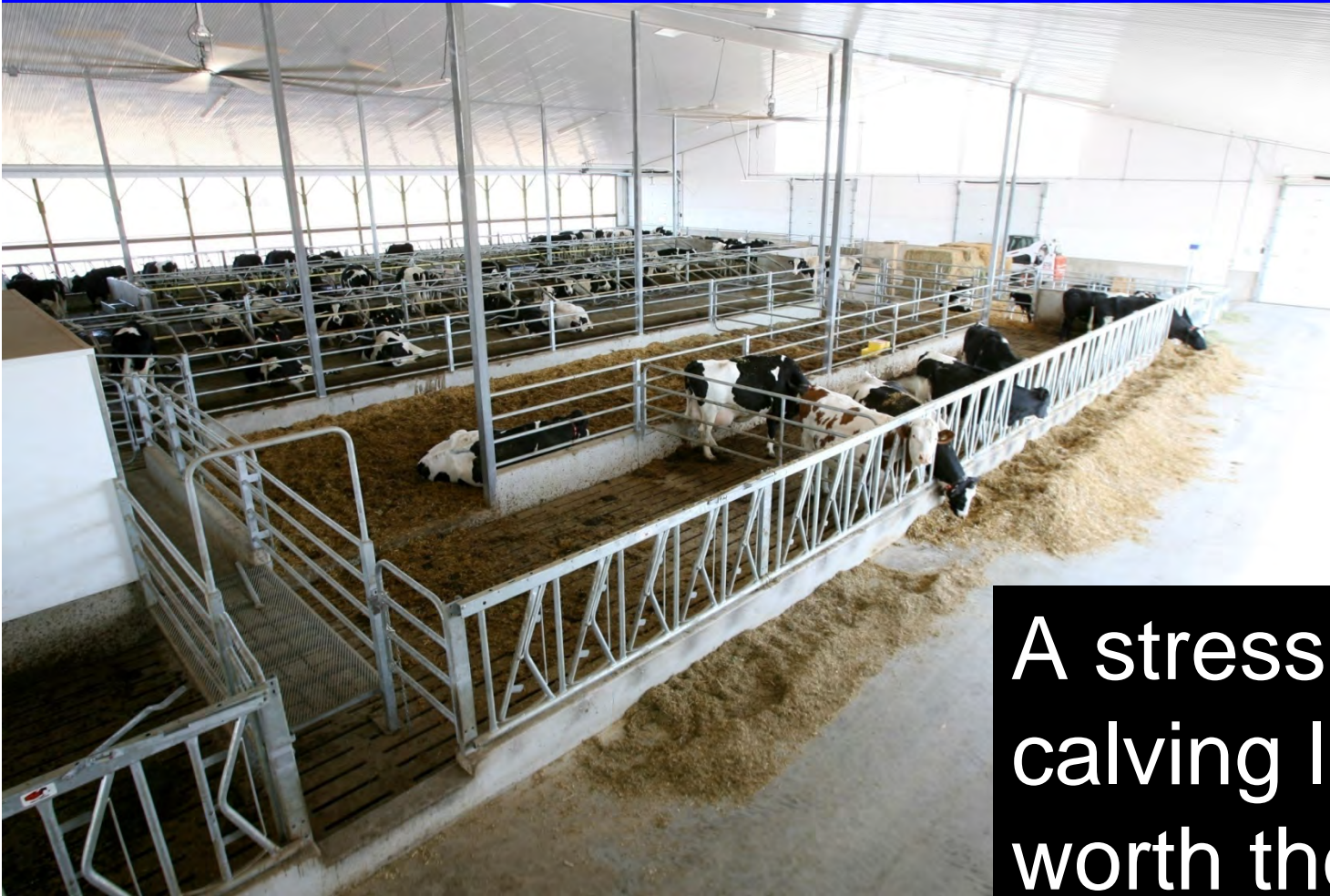
# 1. Minimize bedding use

- eliminate bedding packs:
- heifers in proper sized freestalls from 4 months of age
- dry cows in big comfortable freestalls



# 1. Minimize bedding use

- eliminate bedding packs.....but



A stress free  
calving line is  
worth the cost !



# 1. Minimize bedding use

- select a mattress that works well with minimal bedding.



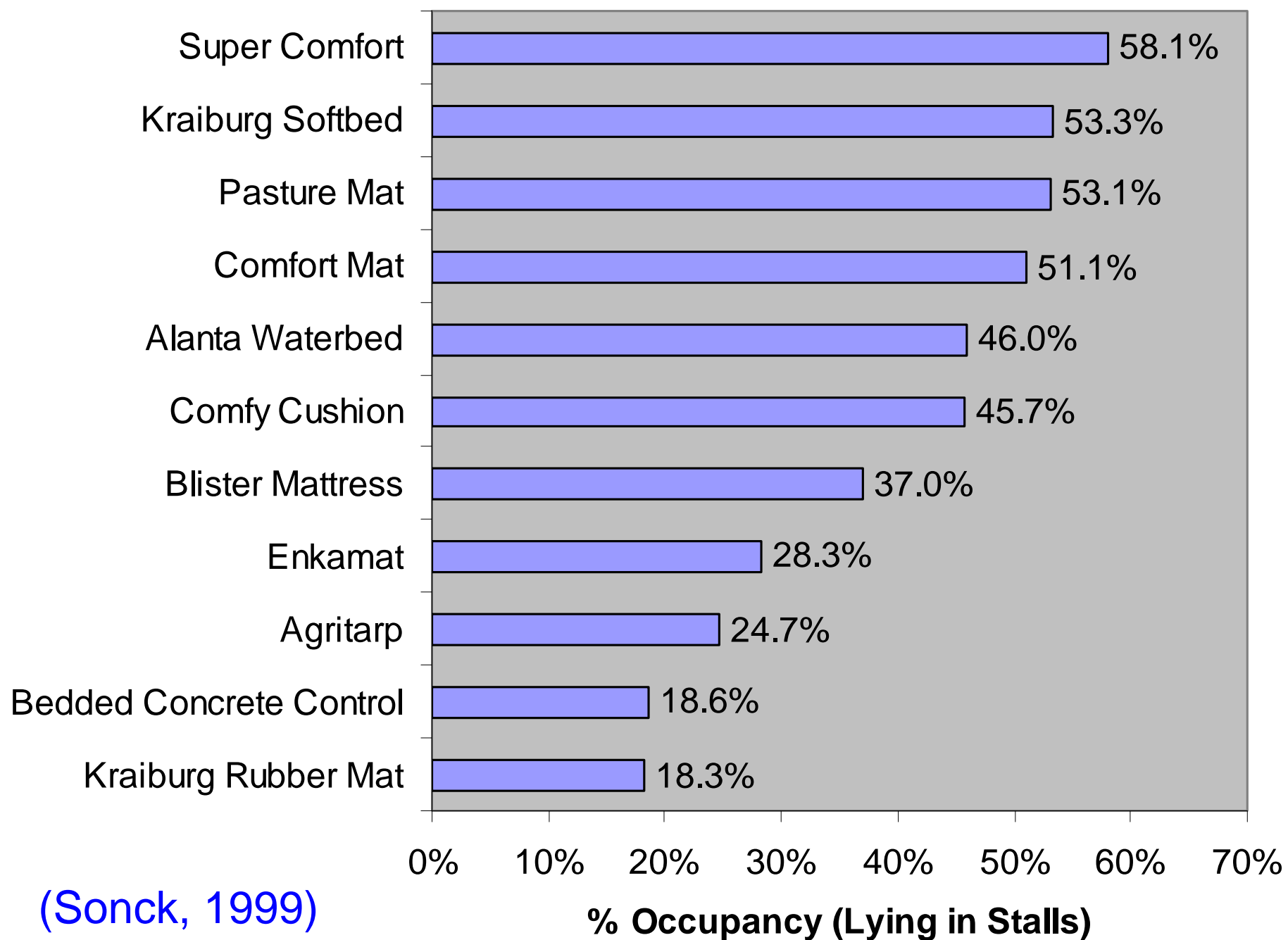




# MADE-IN-PLACE

- 5 - 6" THICK
- 250 - 300 LBS
- SHREDDED RUBBER
- PACKED
- COVER OF CHOICE





# When minimal bedding is used, the best bedding strategy puts fresh material under the udder daily

Russell F. Bey, Jeffrey K. Reneau, and Ralph J. Farnsworth  
University of Minnesota, St. Paul

Farm	Bedding type	Front of stall (cfu/ml)	Middle of stall (cfu/ml)	Rear of stall (cfu/ml)
A	Chopped straw and paper	690,000	19,000,000	41,000,000
B	Ground sunflower hulls	3,850,000	9,925,000	27,275,000
C	Sunflower hulls	1,000,000	3,600,000	25,275,000
D	Pine sawdust	401,500	59,900,000	
E	Particle board	1,040,000	38,275,000	
F	Hardwood	738,000	13,213,500	



Hoehorst Farms, 36 litres/cow  
SCC 80,000 -120,000

## 2. Alternative bedding materials

### Peatmoss:

- longer resting times than straw
- mastitis organisms grew slower in peat than in straw (24 hours vs 6 hours)
- cows were cleaner on peat than on straw, and had fewer lesions
- absorbant and easy to work with in manure
- only drawback is that it is dusty and dark in colour.







## 2. Alternative bedding materials

### Peatmoss:

- What is the cost and will it go up in cost ?
- Is dust a health concern ?

## 2. Alternative bedding materials

### Shredded newsprint:

- Double the absorbency of straw  
(4x its own weight)
- Tends to pack, so bed often or mix with straw
- Not a hazard .....but paper sludge is
- Like sawdust, paper will be scarce or too costly

## 2. Alternative bedding materials

### Digester or Composted Manure Solids:

- used extensively in hot dry areas
- limited experience in our damper climates
- variable success
- some herds struggle with mastitis and high SCC especially in damp weather



temperature and  
retention time !

The advertisement features a large green cylindrical silo with a white control building on top, situated in a grassy field with a forest in the background. The silo has a metal staircase leading to the top. The control building has a window and a door. The advertisement includes the DariTech logo and the text "BeddingMaster By DariTech".

**DARITECH**  
Manure Management

**BeddingMaster**  
By DariTech

*Quit paying for bedding, own it!*

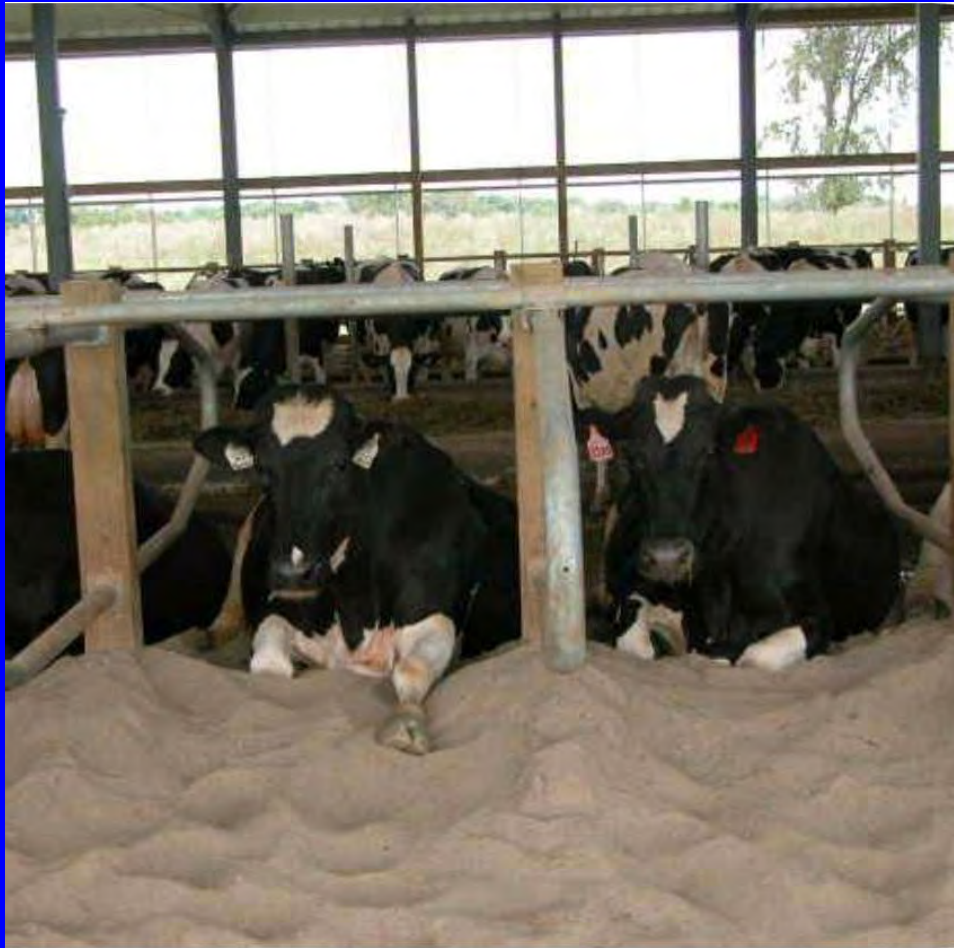




3. The best alternative bedding material by far ....

Sand

# Sand Bedding Benefits



- Less clinical mastitis
- Lower SCC
- No swollen hocks
- Fewer lame cows
- Good comfort in the stalls
- No slipping in the alleys
- Low cost construction

# Sand is only comfortable if you are used to it !

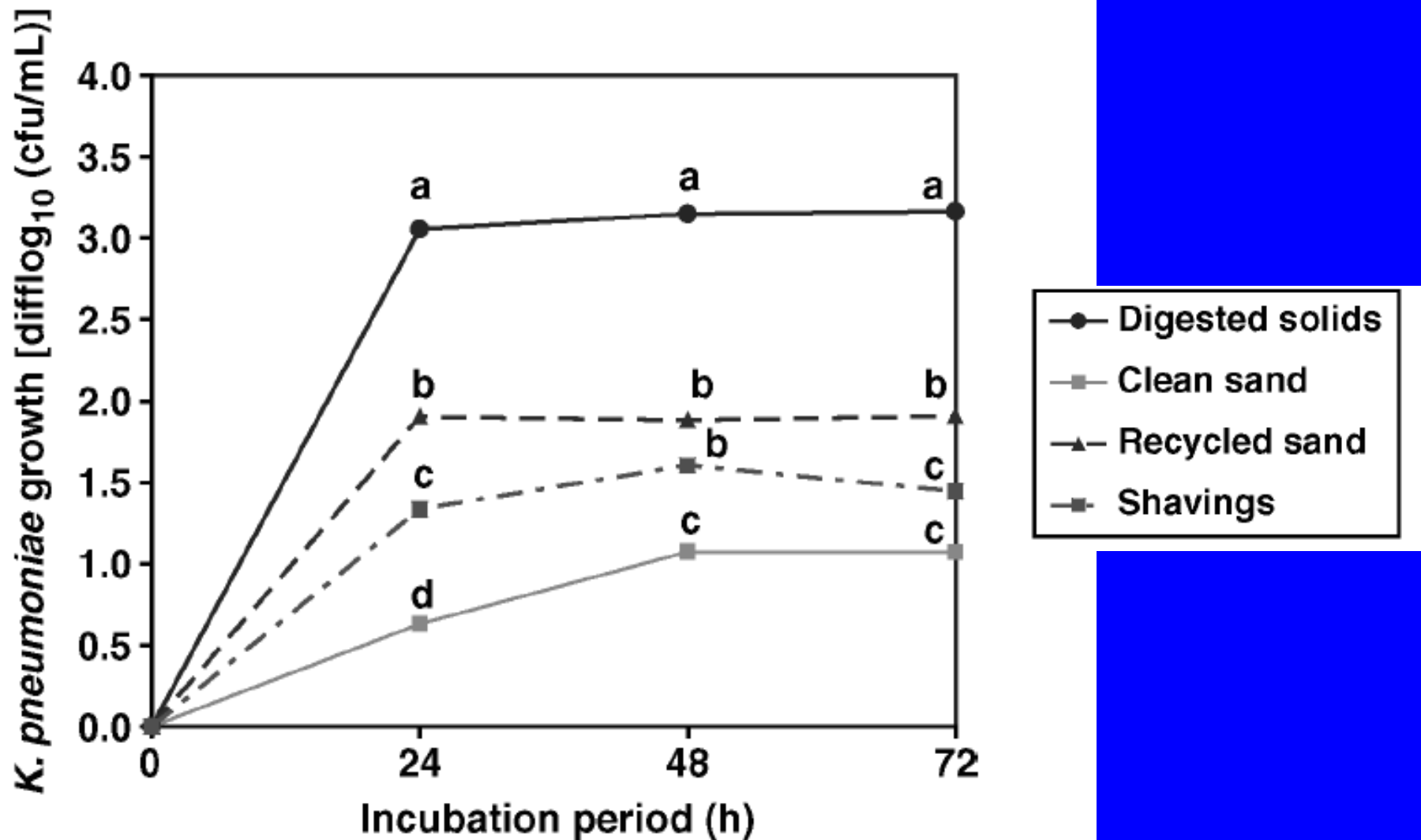
Tucker J. Dairy Sc. 2003 p521

Behavior	Surface		
	Sawdust	Sand	Mattress
Experiment 1 <sup>1,2</sup>			
Lying (h)	14.3 ± 0.83	10.9 ± 1.57 <sup>a</sup>	14.3 ± 0.54
Standing (h)	1.1 ± 0.35	0.7 ± 0.11	1.7 ± 0.40 <sup>a</sup>
Number of lying events	9.1 ± 0.73	6.7 ± 1.06 <sup>a</sup>	9.3 ± 0.68
Experiment 2 <sup>1,2</sup>			
Lying (h)	15.0 ± 0.40	14.9 ± 0.62	13.3 ± 0.54 <sup>a</sup>
Standing (h)	0.4 ± 0.08	0.4 ± 0.10	0.6 ± 0.08 <sup>a</sup>
Number of lying events	10.5 ± 0.57	10.0 ± 0.48	8.5 ± 0.55 <sup>a</sup>



# Sand limits growth of bacteria

S. Godden J. Dairy Sc. 2008 p.151



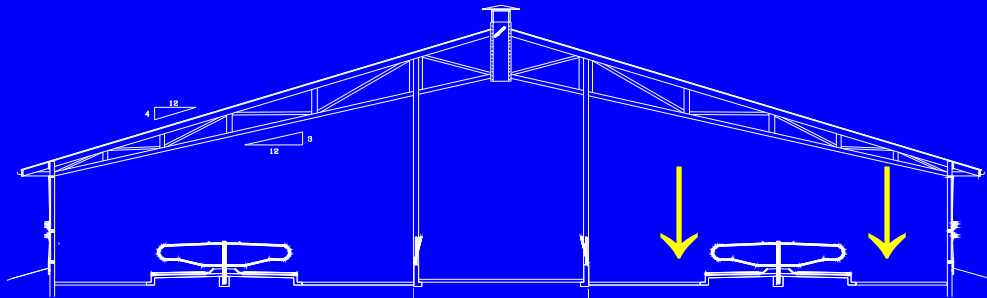
# Sand Improves Foot Health

M. Narring, J. Dairy Sc. 2008 p.570

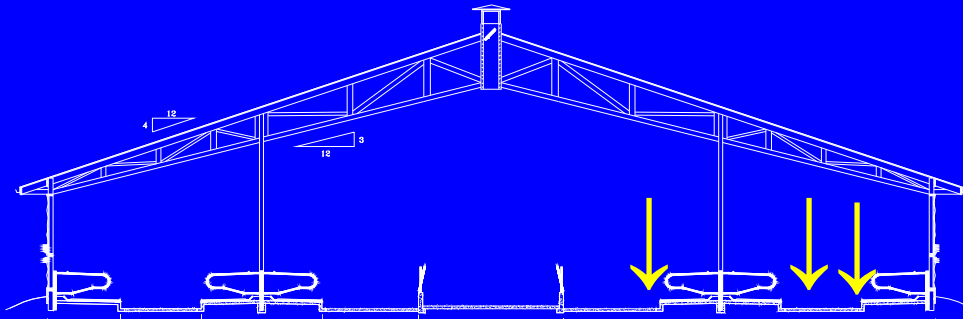
Item	Straw		Sand	
	Beginning 17 cows	End 17 cows	Beginning 17 cows	End 16 cows
Hoof lesion score <sup>1</sup>	5.00 ± 0.48	5.29 ± 0.39	5.63 ± 0.51	3.69 ± 0.34
Sole hemorrhages	46	49	54	41
Heel horn erosion	51	51	68	18
White line disease	7	7	9	3
Other	6	6	6	0

<sup>1</sup>Maximum hoof lesion score is 8; 0 = healthy.

# Sand in all alleys?

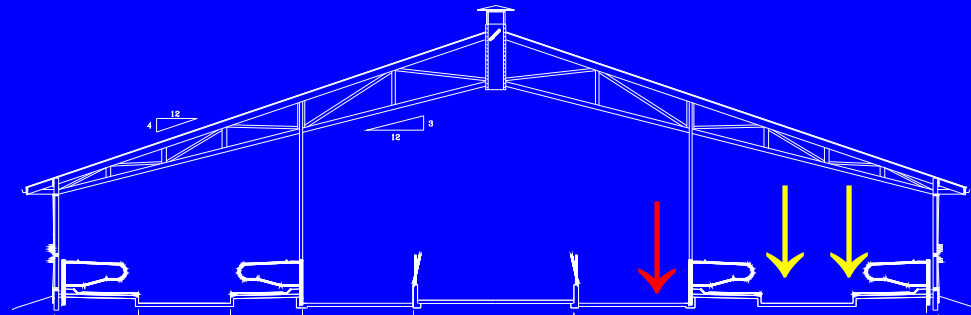


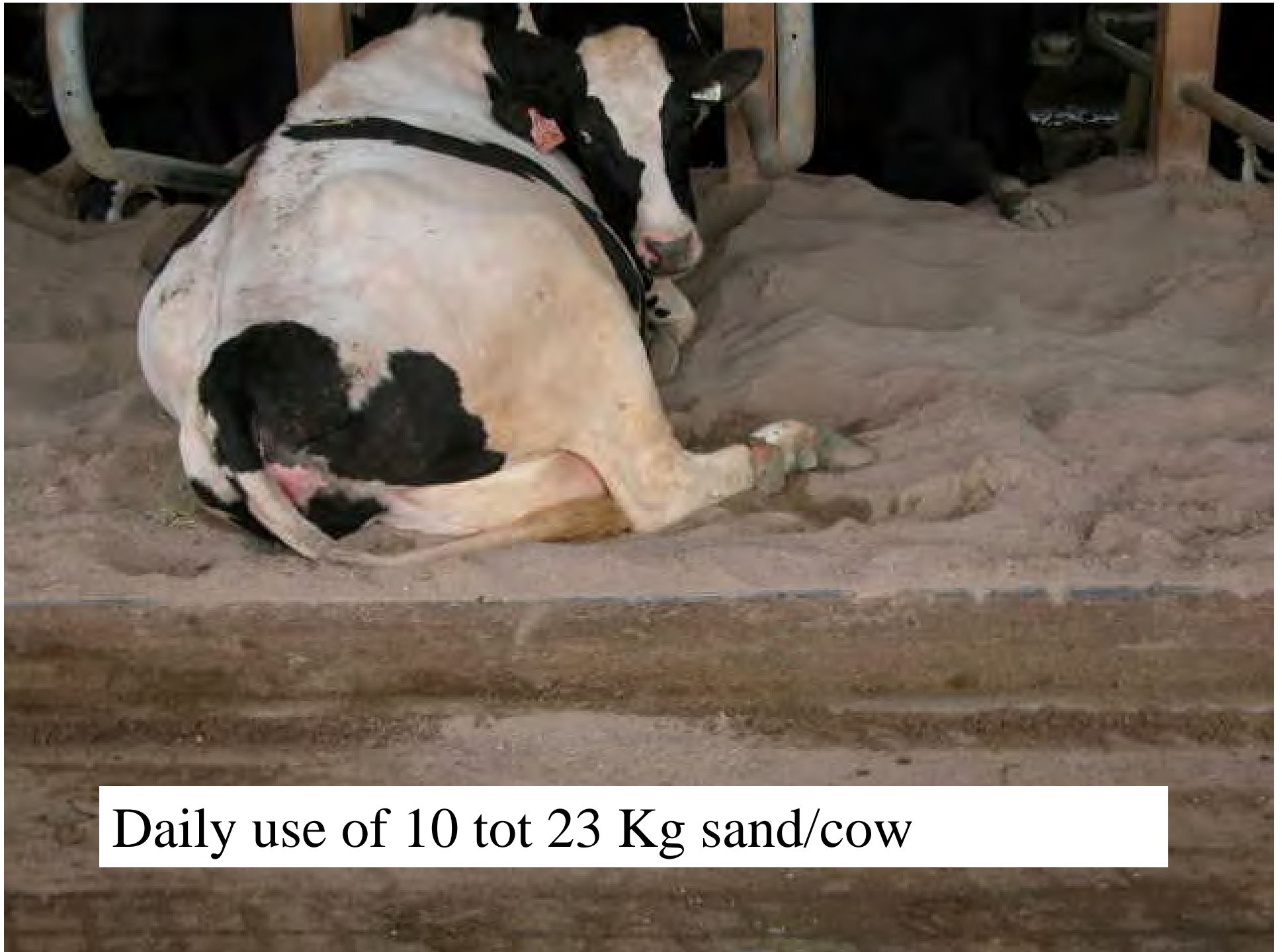
Yes



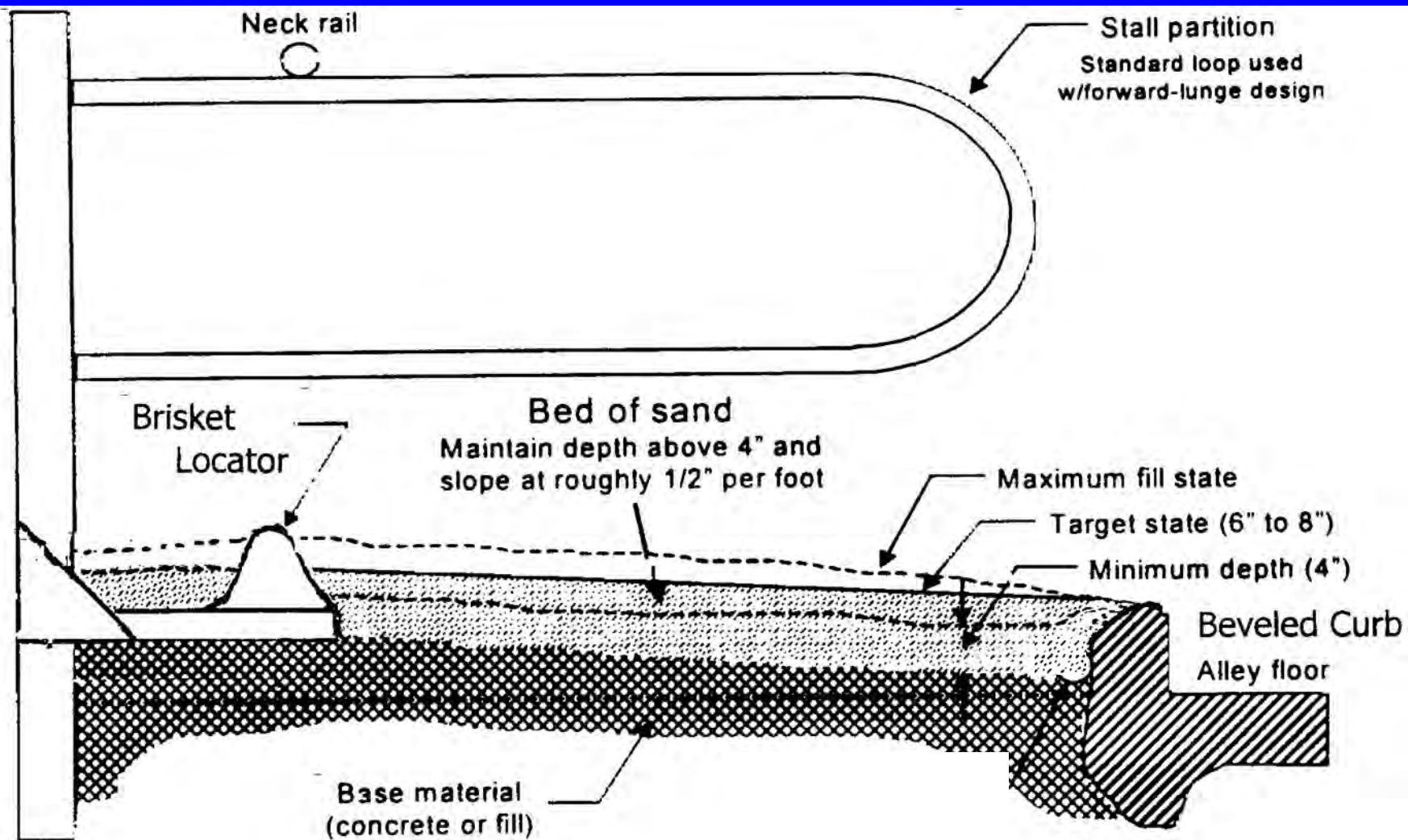
Yes

No





Daily use of 10 tot 23 Kg sand/cow





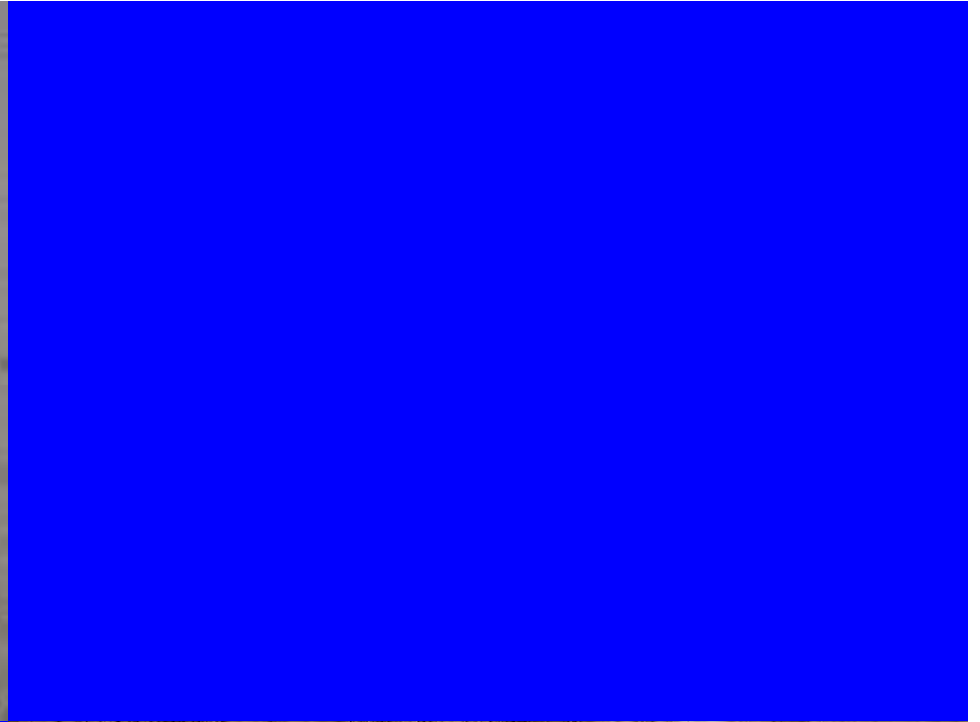


















**Course**



**Medium**



**Fine**



**Extra Fine**



**Course**

- Poor for pump wear
- Good for drainage
- Does not stick to cows
- Sharp stones can cause lameness
- Can lead to bruised knees

Not more than  
5% > 2 mm



**Medium**

**Fine**



Not more than 5%  
< 1 mm

Uniform particle  
size



Packs in the freestall

Does not dry on top

Sticks to the udder

Use cloth, not paper for  
prepping sand bedded  
cows !

**Extra Fine**



## With High Sand

- 20 + Kg per day per stall
- The cow keeps the box clean
- Gives maximum comfort

## With Low Sand

- 10 Kg per day per stall
- Difficult to keep stalls clean
- Exposed curb = swollen hocks





























DeLaval

**DeLaval Agriweb™ Sand Stabilizer**

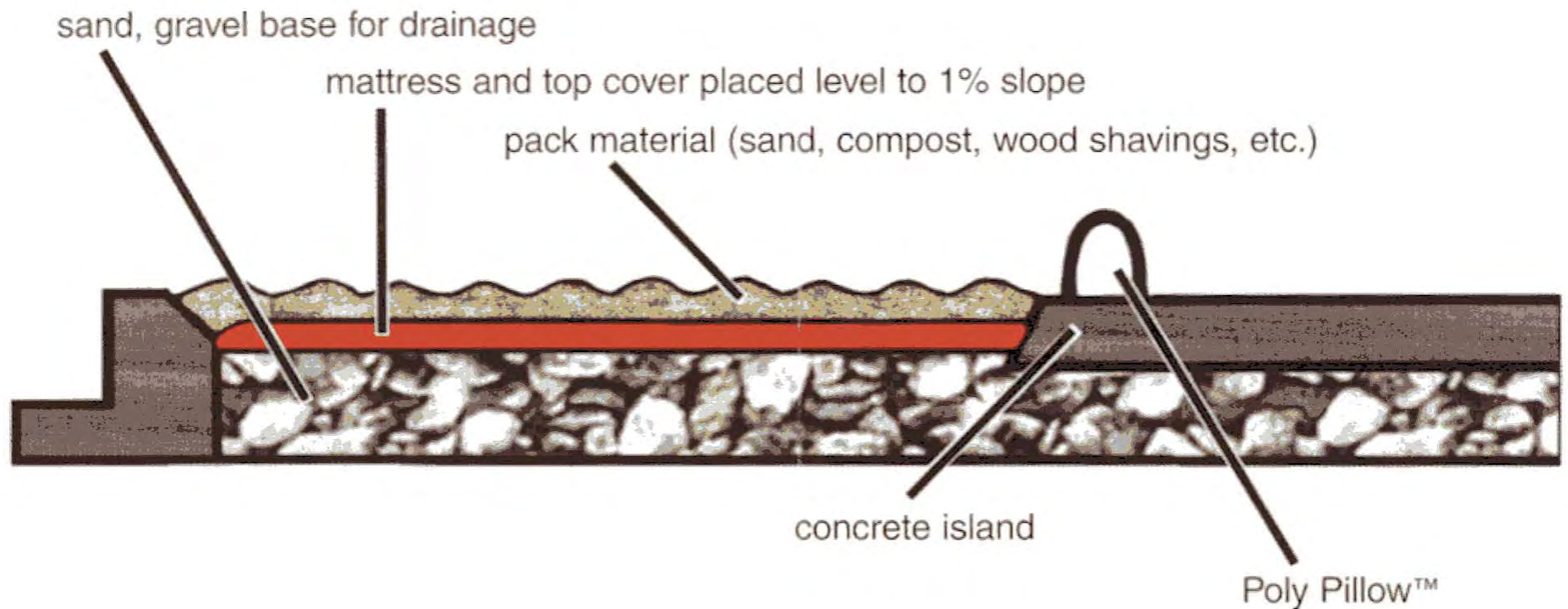
- Expandable, plastic honeycomb structure
- Allows urine and waste to drain
- Reduces sand usage up to 80%
- Leaves 8" of sand at base

DeLaval Cow Comfort Solutions





# PACK MAT





Level but  
don't rake it !





# Bringing in sand...300 -400 Kg/stall



Room to turn (3 m minimum)

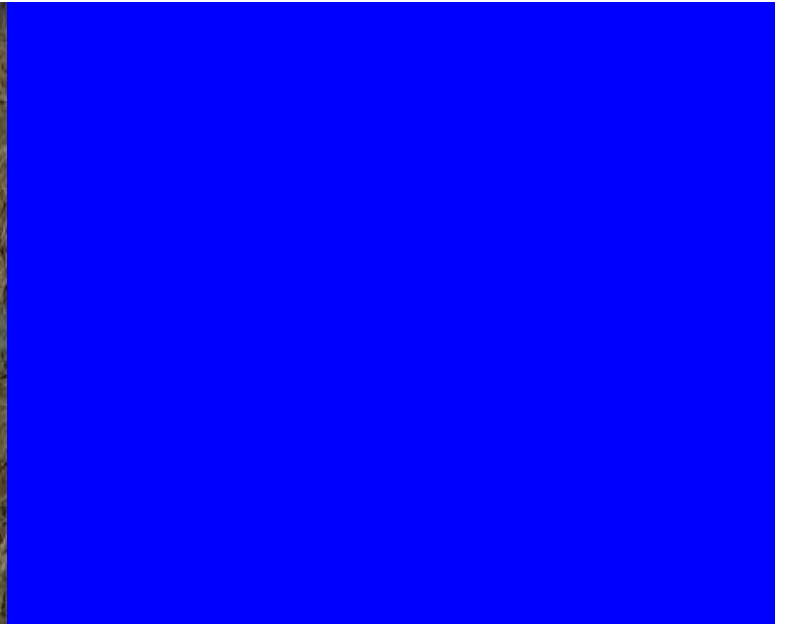
Not on rubber

Cows need to be out of the area...a problem with robotic milking



Bringing in sand 60 -100 Kg/stall













1 Meter<sup>3</sup> sand = 1500 Kg















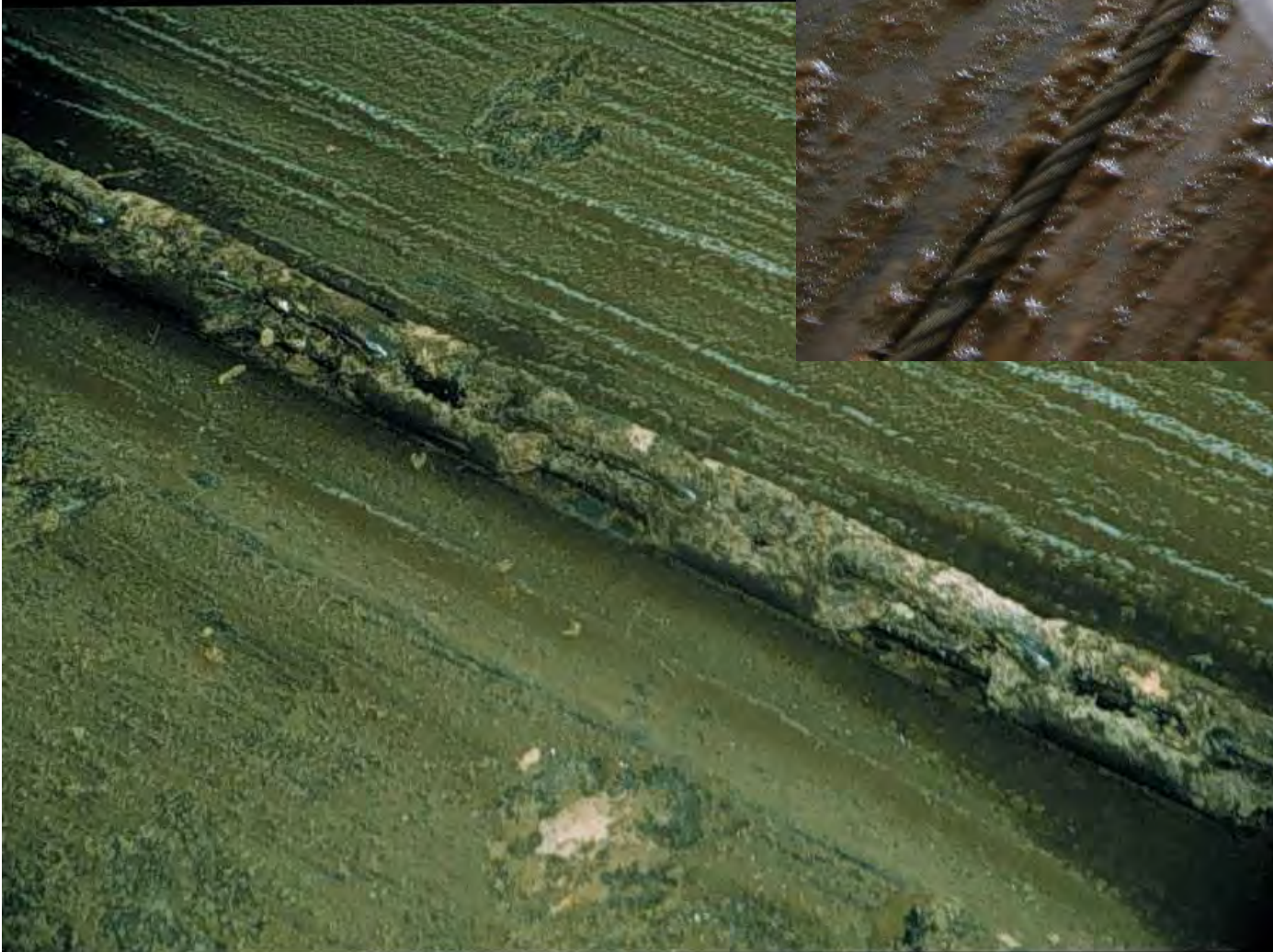






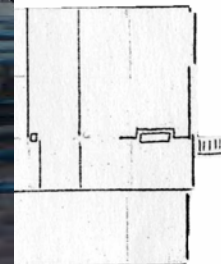
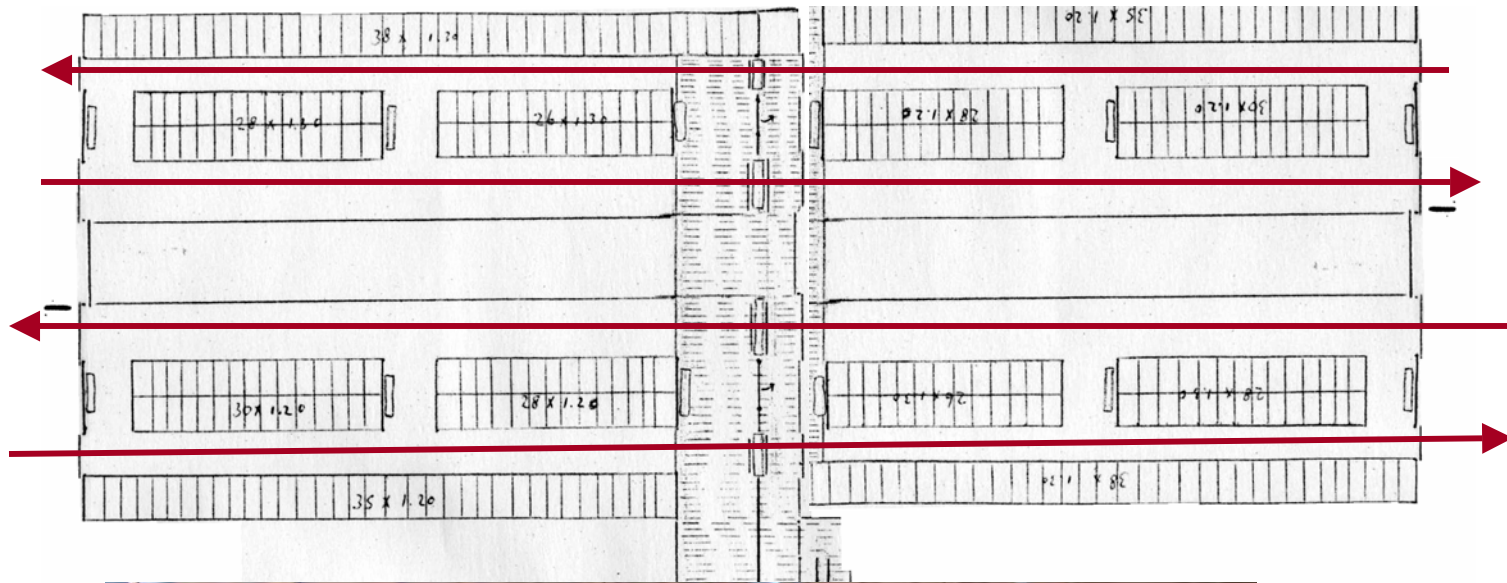


Replace cable yearly  
...try stainless steel ?



Cable  
works  
better than  
chain









Manure + Sand = Soup

Manure + Sand + Water

↓ Washing

= Separation of the sand





John MacKay

120 Cows plus 80  
Heifers

Scrapes with a Bobcat  
Cows 3 x per day,  
heifers once per day



- 75 cm round pipe,  
open on top
- 0.4% slope to manure  
pit
- Wash water goes in  
the top. Then cow  
manure then heifer  
manure
- the pipe is open  
everywhere to facilitate  
manual clean out if  
needed







- The manure pit is closed (about 7 meters)
- The pipe is open on the bottom and closed at the end
- Working for three years without problems















1 year of maximum manure  
application on corn adds about 2  
mm of sand







# Roger Wikkerink

- 60 cows robotic milking





A photograph of a dairy barn interior. In the foreground, a black and white cow is lying down in a stall. The floor is made of wooden planks and is wet, reflecting the overhead fluorescent lights. A metal cable drive scraper is visible on the floor, moving from left to right. In the background, several other cows are standing in their stalls. The barn has a high ceiling with metal support beams and large fans hanging from it. A black text box with white text is overlaid in the center of the image.

Scrapes with a cable  
drive scraper





The scraper drops it in a rectangular channel  
with a Houle bucket scraper



















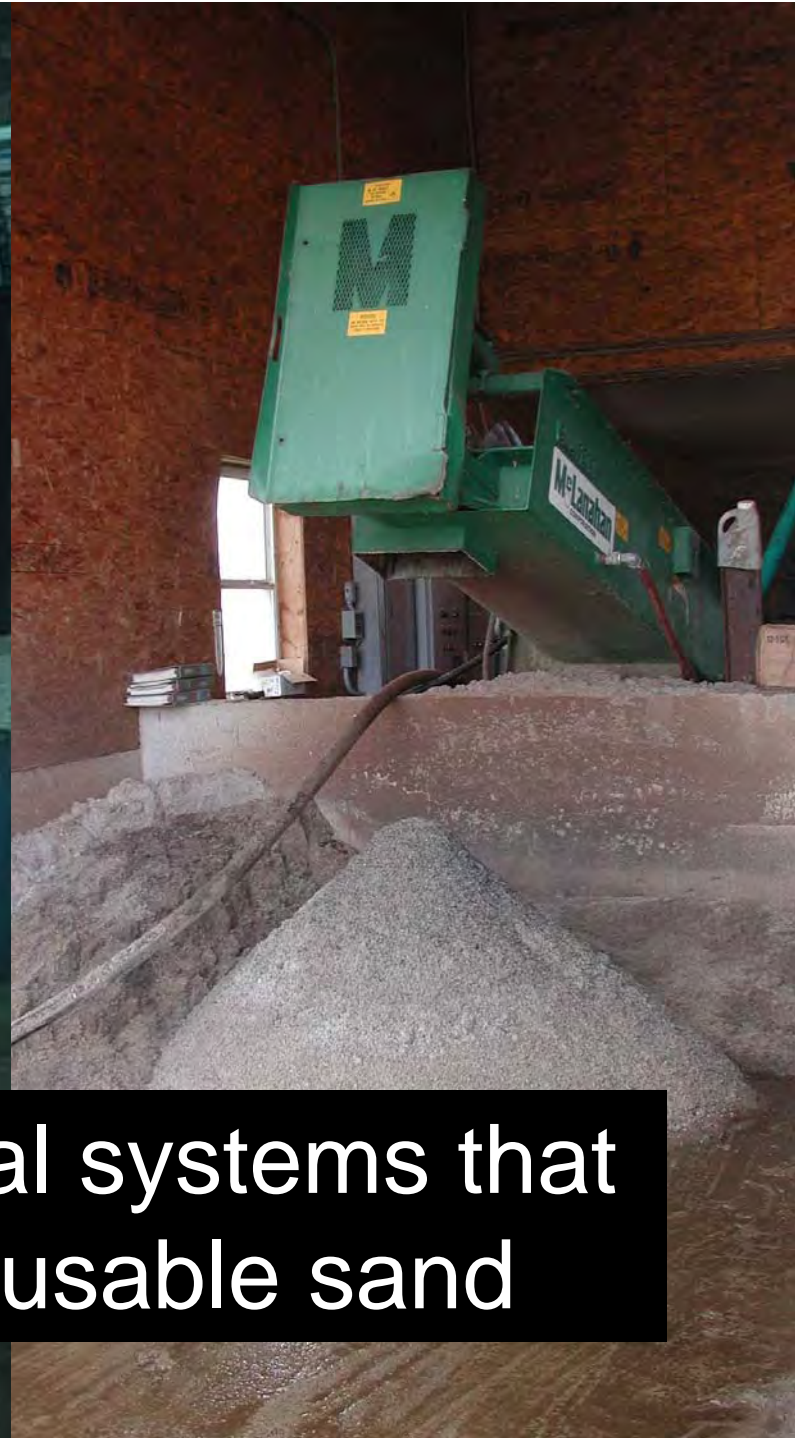
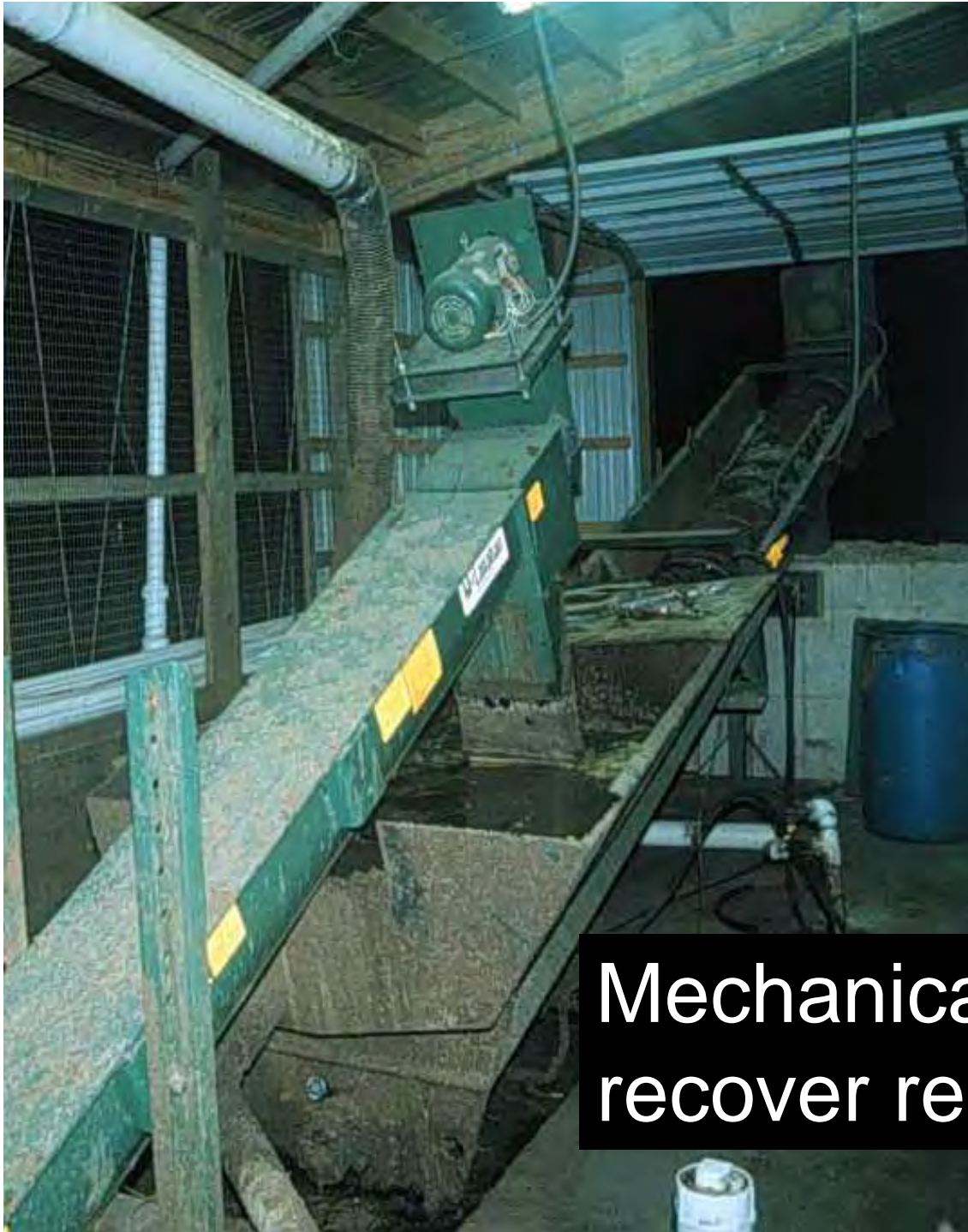
Flush gutter with settling basin



# Sand lane systems recover reusable sand







Mechanical systems that  
recover reusable sand









**The cows say Absolutely Yes !!!**



Thank You !



Questions?