

Budgeting for a Dairy Modernization

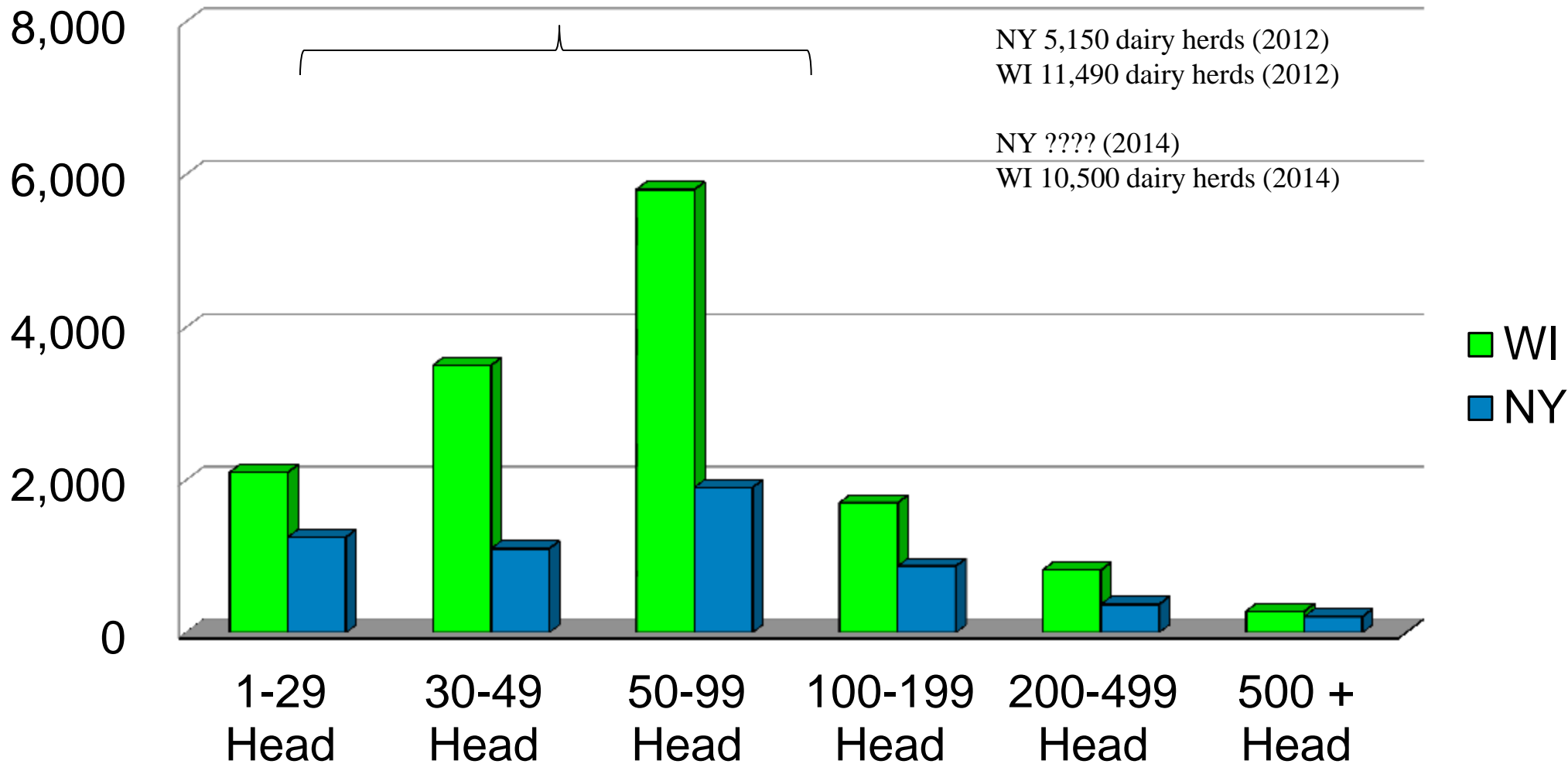


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WI and NY Dairy Farms by Herd Size, 2007*

WI 11,400 herds or 80% of 14,200 herds
 NY 4,250 herds or 75% of 5,700 herds

Average herd size NY 118 cows (2012)
 Average herd size WI 111 cows (2012)

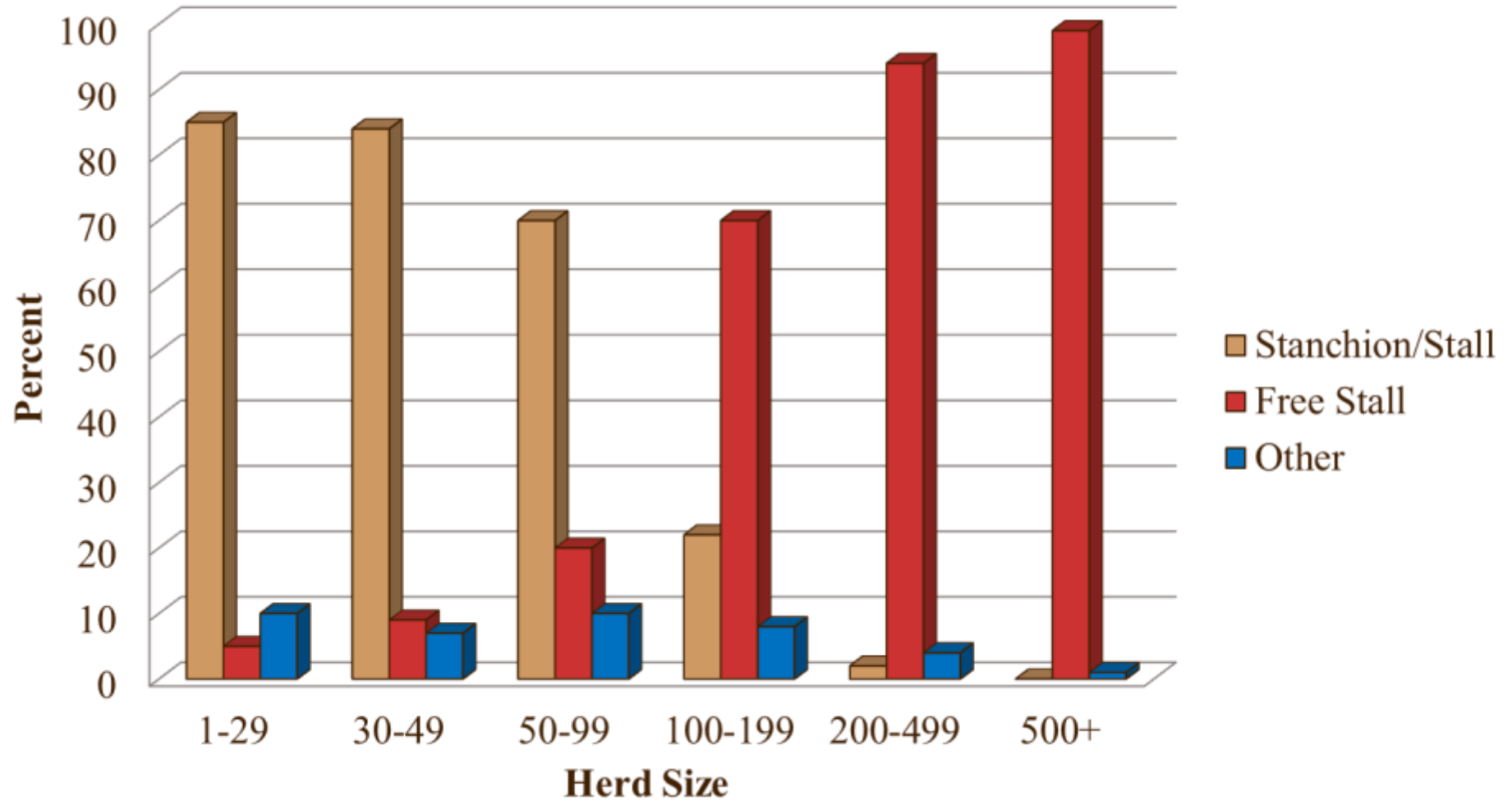


NY 5,150 dairy herds (2012)
 WI 11,490 dairy herds (2012)

NY ???? (2014)
 WI 10,500 dairy herds (2014)

*USDA/NASS

Milk Cows by Type of Housing Wisconsin, 2010



Common Goals

- What are your goals for the dairy farm business?

Common Goals

- **Improved Quality of Life**
 - **Increase Family Time**
- **Improved Health/Safety**
- **Transition In/Out**
 - **Allow Senior Partner to Exit Operation**
 - **Allow New Partner to Enter Operation**
- **Labor**
 - **Milk in a Reasonable Amount of Time**
 - **Use Existing Labor Force**
 - **Improve Labor Efficiency**
- **Economic**
 - **Manage Debt Load**
 - **Low Capital Cost**
 - **Improve Profitability**

Dairy Modernization

- **Improved cow comfort**
- **Increased dry matter intake (DMI)**
- **Labor efficiency (2 x more cows)**
- **Improved operator health and safety**
- **Increased profit**
- **Improved quality of life**

Farmstead Master Plan

- **A farmstead master plan is a set of drawings and documents that describes the site plan with:**
 - ✓ **Physical boundaries**
 - ✓ **Natural boundaries**
 - ✓ **Existing facilities**
 - ✓ **Planned/ Proposed improvements**
- **Define the benefits/limits of the site**

Limitations to growth

What are the limitations of growing your family dairy farm business?

Limitations to growth

▪ Physical Resources

– Site Conditions

- Topography
 - Elevations/slopes
- Drainage Patterns
- Streams
- Water Bodies
- Water well

– Current Facilities

- Parlor Size/Capacity
- Housing
- Manure Storage
- Feed Storage

▪ Physical Resources

– Site Restrictions

- Land Base (Acres)
- Property Boundaries
- Setbacks
- Roads
- Zoning
- Utility Corridors
 - Electric
 - Gas

Limitations to growth

■ Economic Resources

- Equity
- Debt Capacity
- Risk Tolerance
 - Generational differences

■ Personal Resources

- Goals
 - Personal
 - Business
- Labor
 - Availability
 - Management
- Peer Pressure
- Neighbors
 - Ag
 - Non-Ag

Strategies to Manage a Small Budget

“Build in Phases”

- **Phase 1 Build new cow barn**
 - with short term manure storage
- **Phase 2 Retrofit a parlor in the stall barn**
- **Phase 3 Build feed storage**
- **Phase 4 Add more cow barn(s)**
- **Phase 5 Build new parlor**
- **Phase 6 Add more cow barn(s)**
- **Phase 7 Build new long term manure storage**

**How much for a new Freestall Barn
Parlor, Feed Storage, Manure
Storage on a new site for
150 cows?**

- \$300,000**
- \$600,000**
- \$900,000**
- \$1,200,000**

Step 1

Build cow barn for cow comfort

- **Housing System Design which:**
 - ✓ **Provides adequate space for resting, eating, drinking, and walking**
 - ✓ **Protects the cow from severe environmental conditions**
 - ✓ **Limits the likelihood of injury and/or disease**

Facility Costs in Wisconsin

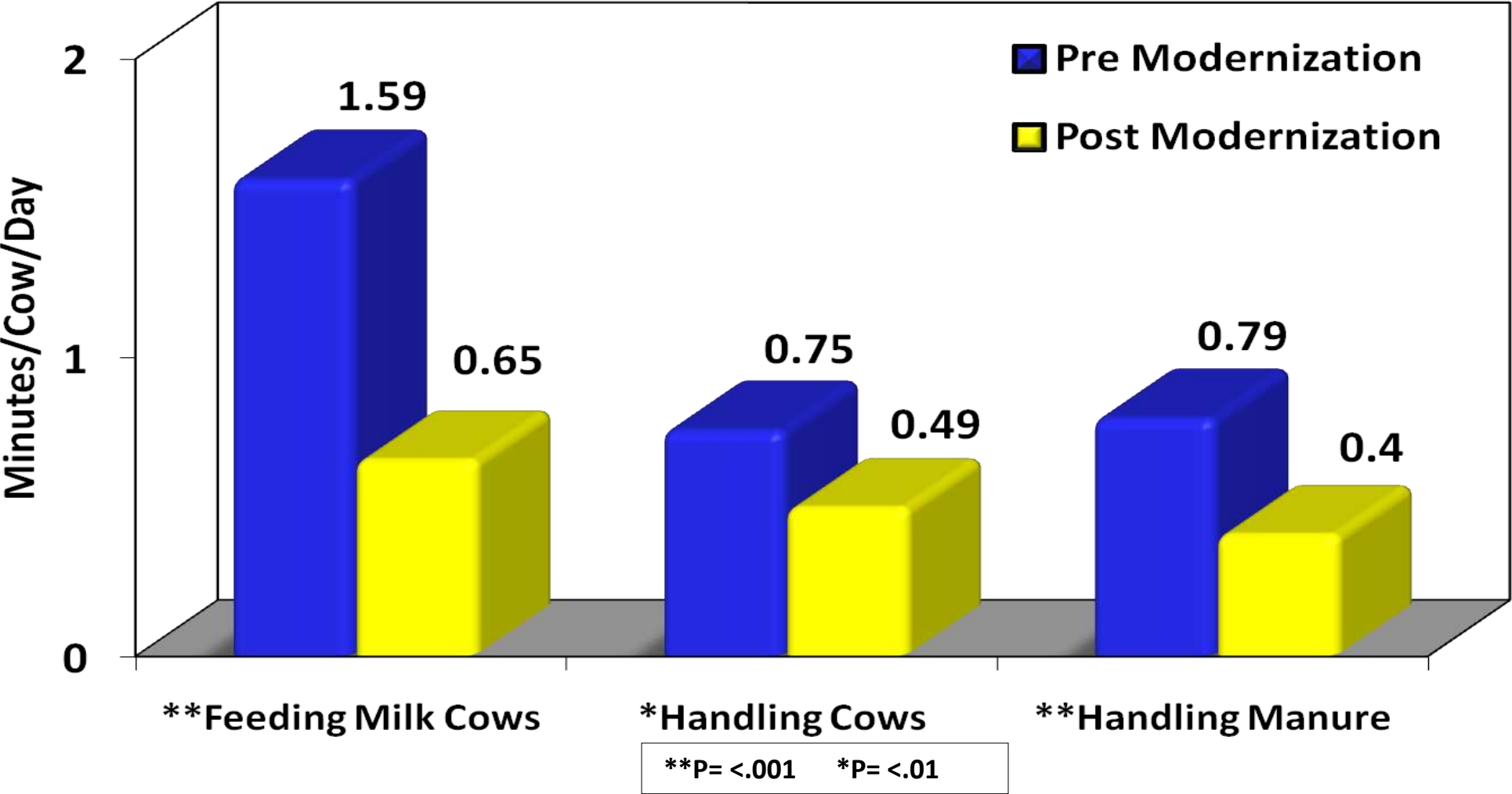
- Housing Cost
 - ✓ \$2,000-\$3,000/ cow
- Milking Center Cost
 - ✓ \$20,000 - \$25,000/ milking stall
 - ✓ Double 8 parlor cost - \$320,000 - \$400,000
- Feed Storage
 - ✓ \$500/ cow
- Manure Storage
 - ✓ \$700/ cow
- Total Capital Cost
 - \$8,000-\$10,000/Cow
- Calf Housing Cost
 - ✓ \$750/ calf
- Heifer Housing Cost
 - ✓ \$1,000 - \$1,500/ animal
- Bio Gas Generation
 - Plug Flow - \$1100/cow
 - Mixed Flow - \$900/cow
- Sand Separation \$750/cow
- Solid Separation \$200/cow
- Freestall Bedding Cost
 - ✓ Sand @ \$11/ Mton
 - ✓ 23 kg/cow-day = \$.25/cow-day
 - ✓ Wood Shavings @ \$110/Mton
 - ✓ 7 kg/cow-day = \$.75/cow-day
 - ✓ Biogas solids @ \$33/Mton
 - ✓ 10kg/cow-day = \$.33/cow-day

Dairy Modernization Impacts

	Pre Modernization	Post Modernization	Change
Average Herd Size	82	203	+ 121
Average Production per Cow (lbs)	20,245	21,684	+ 1,439
Milk Production per Farm Annually (lbs.)	1,660,090	4,401,852	+ 2,741,762
Annual Hours of Labor per Cow	51.8	26.0	- 25.8
Milk Cows / F.T.E.	35	50	+ 15

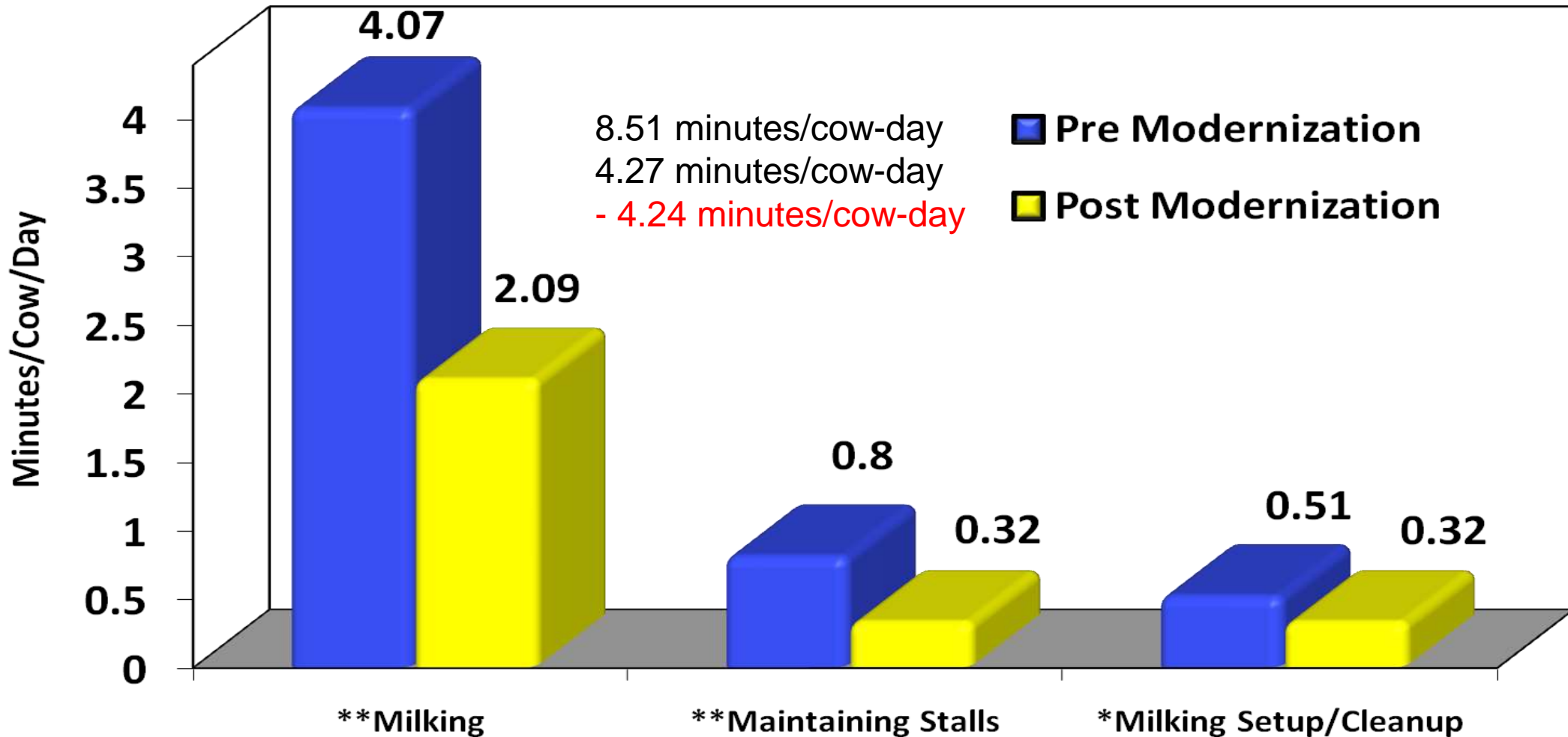
Pre and Post Labor Requirements

Average Per Cow/Day



Pre and Post Labor Requirements

Average Per Cow/Day

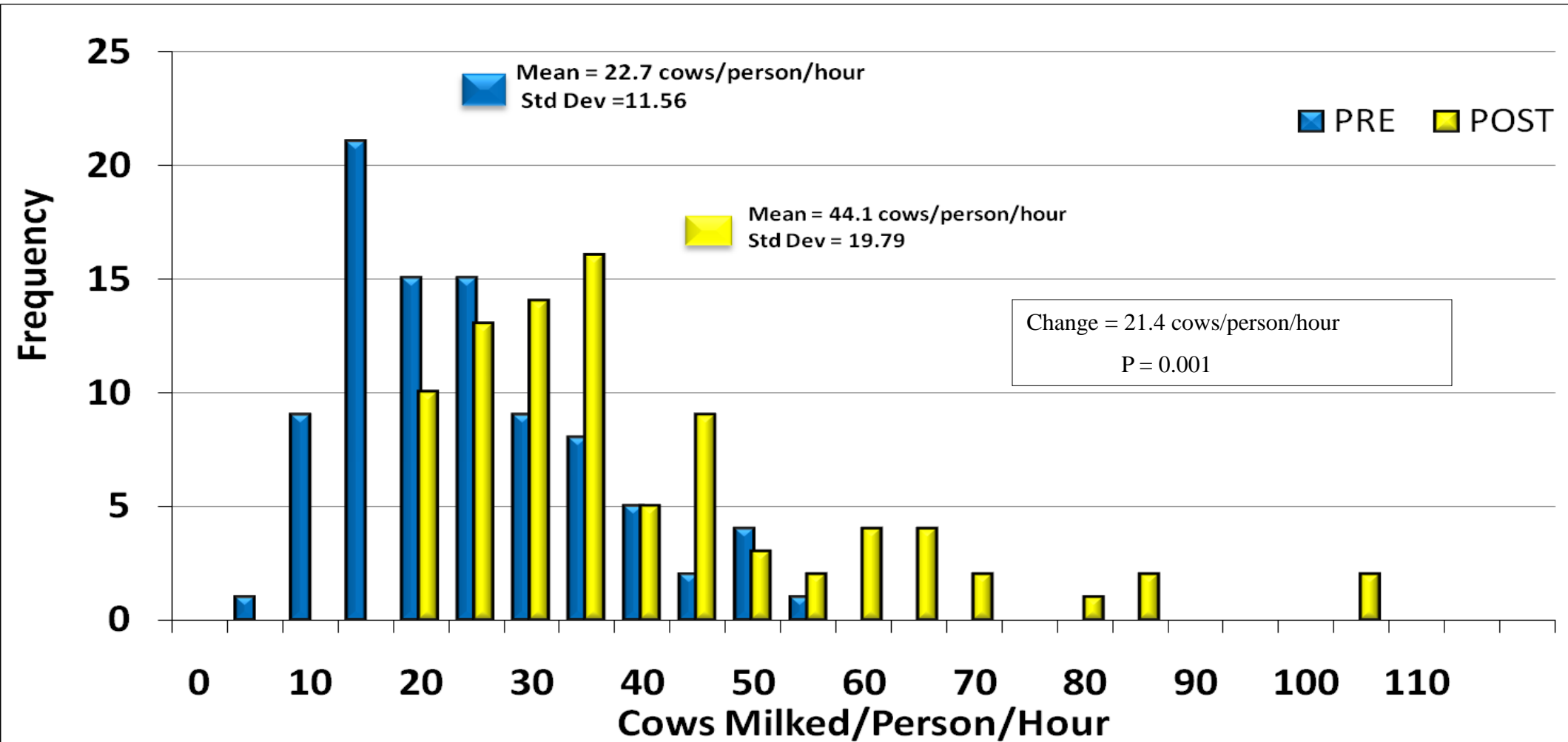


**P= <.001 *P= <.01

Economic Impacts from Reduced Hours Labor Per Cow

	Reduction/Cow/Year	Dollar Impact
Milking Setup/Cleanup	1.16 hours @ \$12/Hour	= \$13.92
Milking Time	12.05 hours @\$12/Hour	= \$144.60
Feeding Time per Cow	5.72 hours @ \$12/Hour	= \$68.64
Time Handling Cows	1.58 hours @ \$12/Hour	= \$18.96
Maintaining Stalls	2.92 hours @ \$12/Hour	= \$35.04
Handling Manure	2.37 hours @ \$12/Hour	= \$28.44
Totals:	25.80 Hours/Cow/Year	\$309.60/Cow/Year

Milking System Throughput



Step 2

Build a Milking Facility

Options

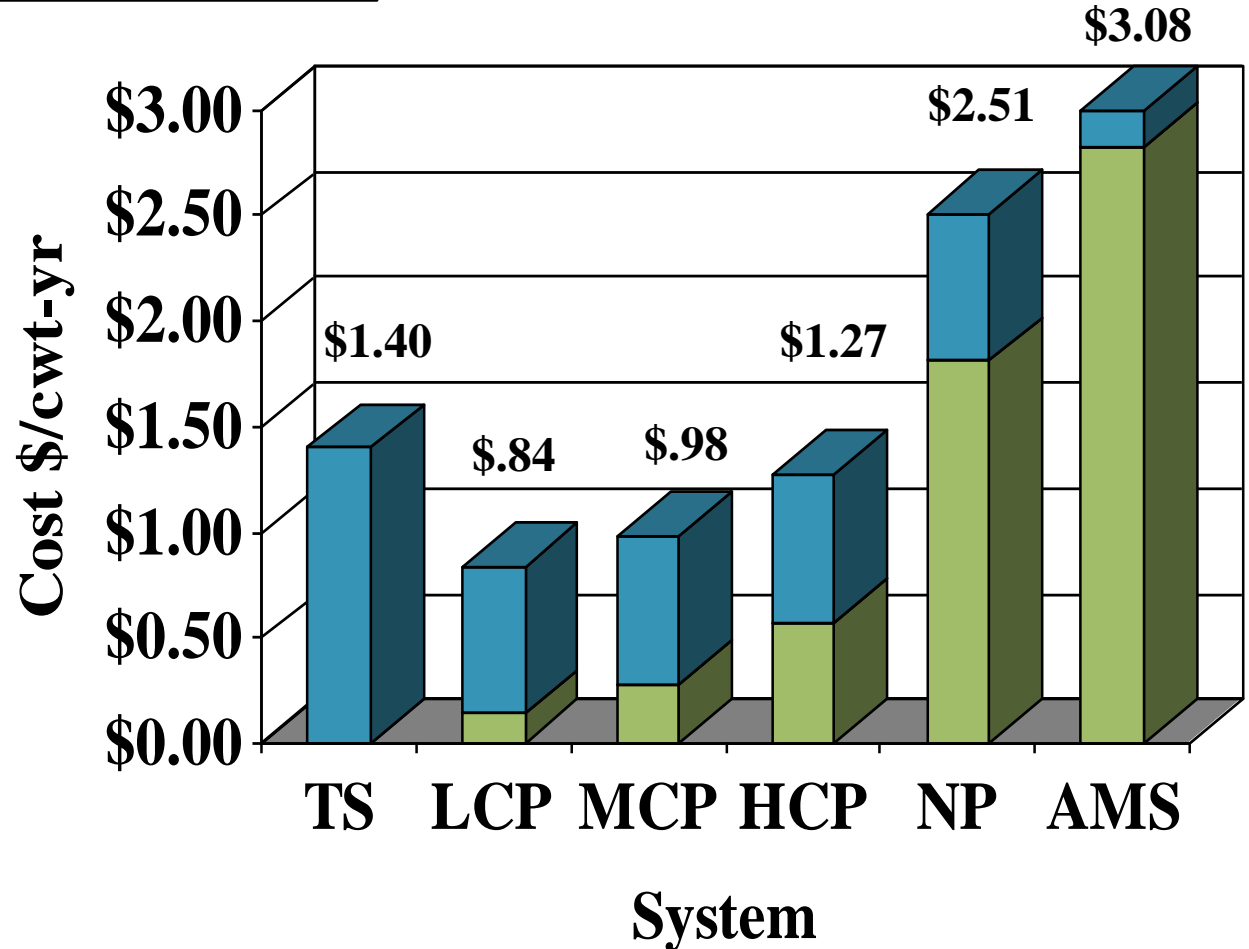
- 1. Remodel Parlor into stall barn and use milk house**
- 2. Add shell for parlor to stall barn and use stall barn for holding area and use milk house**
- 3. Build new shell at new site with cow barn**

Parlor Annual Capital and Labor Costs



120 cows 25,000 lbs
 @ \$12/hr labor
 7 year payback @ 5%

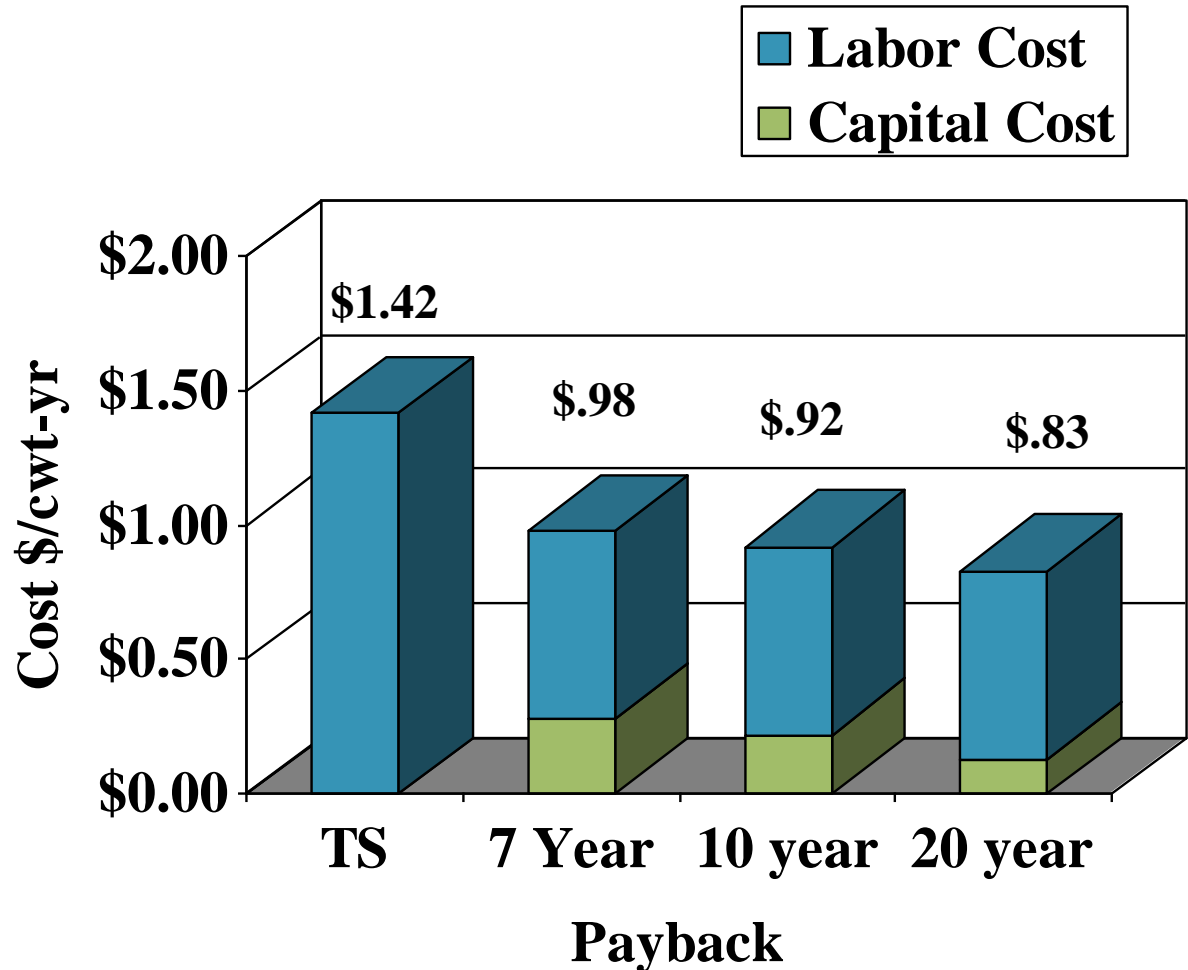
- Tie Stall
 - \$42,048/year labor
- Low Cost Remodeled Parlor
 - \$25,000-capital (\$4,250 annual)
 - \$21,024/year labor
- Medium Cost Remodeled Parlor
 - \$50,000-capital (\$8,500 annual)
 - \$21,024/year labor
- High Cost Remodeled Parlor
 - \$100,000-capital (\$17,000 annual)
 - \$21,024/year labor
- New Parlor
 - \$320,000 (\$54,400 annual)
 - \$21,024/year labor
- AMS
 - \$500,000 (\$85,000 annual)
 - \$7,500/year labor



Annual Cost Payback Timeframe

120 cows 25,000 lbs
@ \$12/hr labor
@ 5%

- Tie Stall
 - Labor Only
- Medium Cost Remodeled Parlor = \$50,000
 - 7 year \$17,000/year
 - 10 year \$13,000/year
 - 20 year \$4,000/year

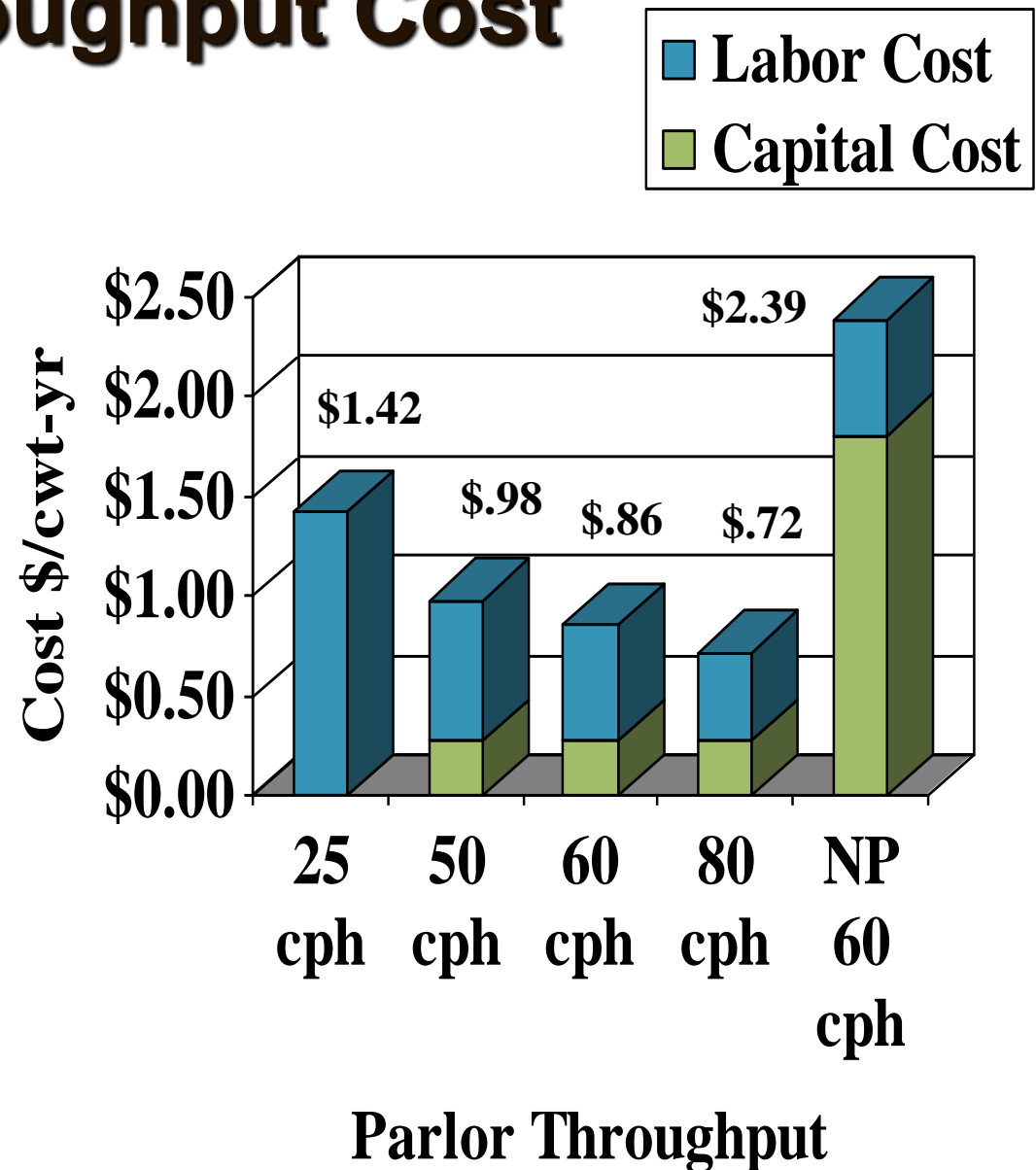


Annual Parlor Throughput Cost

120 cows 25,000 lbs
@ \$12/hr labor
@ 5%

- Tie Stall
25 cph = \$42,048/year labor
- Medium Cost Remodeled Parlor = \$50,000
- New Parlor Cost = \$320,000

50 cph = \$21,024/year labor
60 cph = \$17,520/year labor
80 cph = \$13,140/year labor

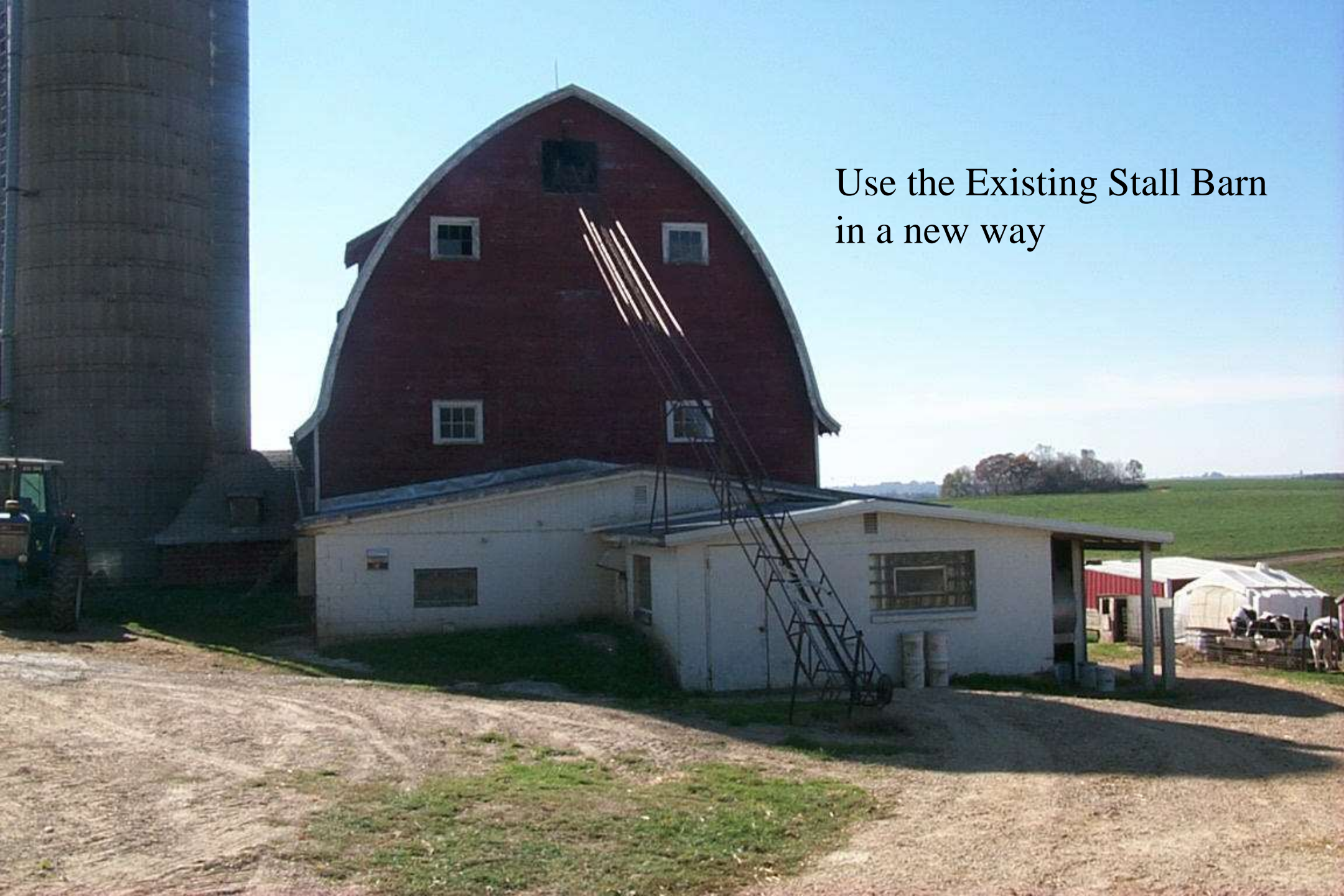


Strategies to Manage a Small Budget for the Milking Center

1. Space
2. Parlor Stall Choice
3. Milking Equipment Choice
4. Parlor Interior Finish
 - ✓ Receiver Group Location
 - ✓ Milking Unit Storage and Cleaning Location
5. Sweat Equity

Strategies to Manage a Small Budget “Space ”

- Use the existing milk house in a new way
- Use the existing stall barn space in a new way
- Minimize moving posts and structural changes
- Minimize new construction
 - Add new space if necessary
- Value of existing facilities
 - Structure
 - Electrical
 - Plumbing
 - Value can be \$75,000 - \$100,000
- New Parlor Space \$30-\$40/s.f.



Use the Existing Stall Barn
in a new way

Use the Existing Milk
House in a new way



Strategies to Manage a Small Budget “Parlor Stall”

- Home built parlor stall < \$3,000 for steel for double 8 (16 stalls)
- Dealer built parlor stall, \$ Steel x 2 for \$ Labor = \$400-\$500/stall
- Buy used parlor stall, \$2,500-\$5,000/stall
- Buy economical new parlor stall, \$5,000-\$10,000/stall
- New parlor stall, \$10,000-\$15,000/stall

Parlor Equipment Costs*

Parlor Type	Average Number of Stalls	Number of Parlors	Cost per Milking Stall
Autoflow	9	2	\$14,800
Flat	11	5	\$3,550
Herringbone, used	16	2	\$3,925
Herringbone, new	16	7	\$7,575
Parallel, used	24	2	\$6,775
Parallel, new	22	26	\$9,250
Rotary	28	2	\$7,750
Swing	20	3	\$2,650

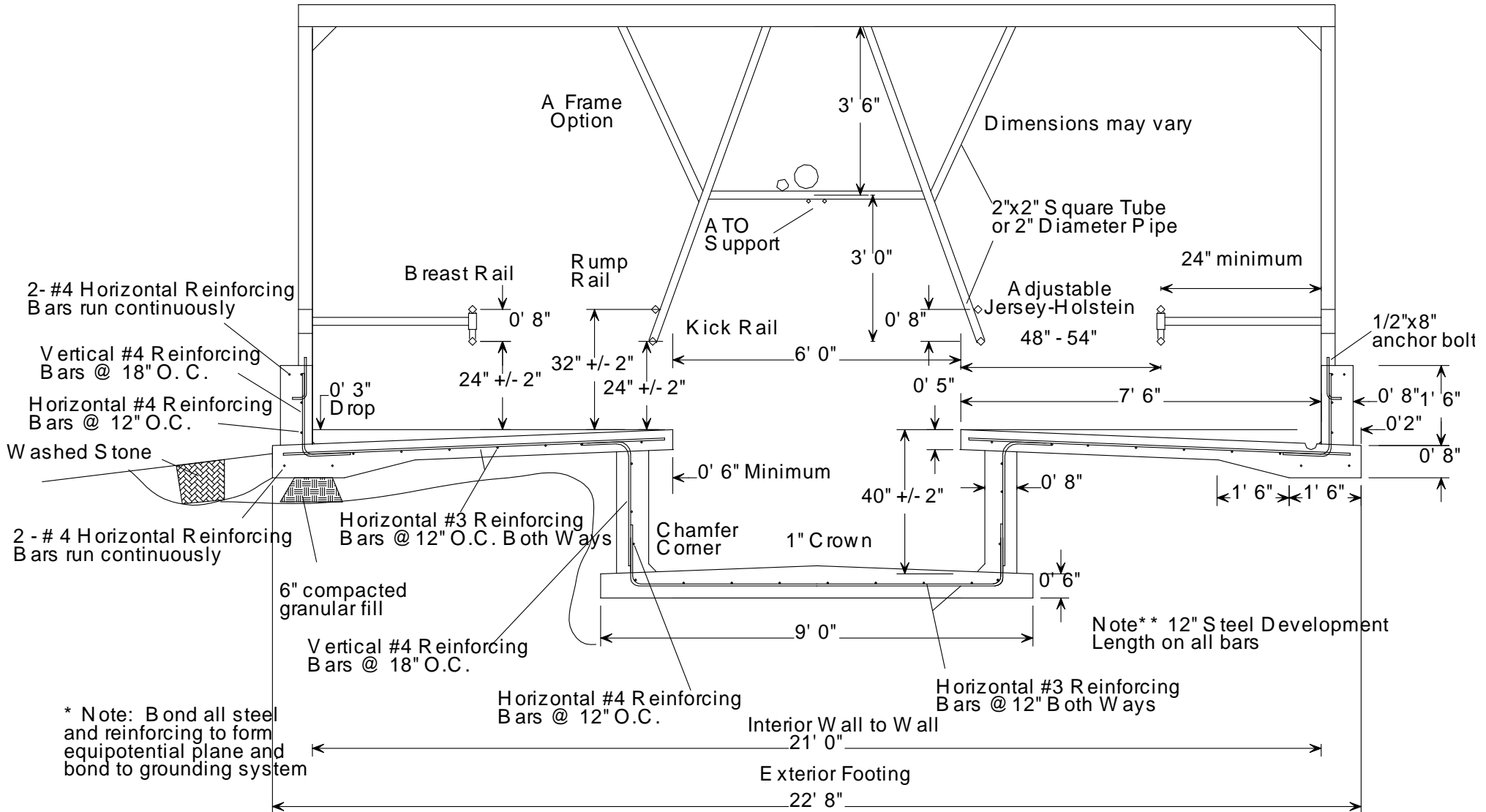
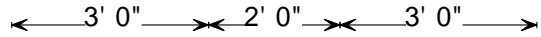
* FCA Cost Data 2007

Parlor Cost per Milking Stall

2008 Dollars

Parlor Stall Type	Retrofit Construction (n=55)	New Construction n= 34
Flat barn	\$3,360 (n=6)	NA
Parabone	\$3,845 (n=30)	\$6,016 (+\$2,171) (n= 10)
Herringbone	\$9,657 (n=8)	\$18,769 (+\$9,112) (n=3)
Parallel	\$7,478 (n=11)	\$22,361 (+\$14,883) (n=18)

Frames Spaced
@ 6' - 8' O.C. Typical



2- #4 Horizontal Reinforcing Bars run continuously

Vertical #4 Reinforcing Bars @ 18" O.C.

Horizontal #4 Reinforcing Bars @ 12" O.C.

Washed Stone

2- #4 Horizontal Reinforcing Bars run continuously

Horizontal #3 Reinforcing Bars @ 12" O.C. Both Ways

6" compacted granular fill

Vertical #4 Reinforcing Bars @ 18" O.C.

Horizontal #4 Reinforcing Bars @ 12" O.C.

Horizontal #3 Reinforcing Bars @ 12" Both Ways

* Note: Bond all steel and reinforcing to form equipotential plane and bond to grounding system

Interior Wall to Wall 21' 0"

Exterior Footing 22' 8"

Note** 12" Steel Development Length on all bars

A Frame Option

Dimensions may vary

2"x2" Square Tube or 2" Diameter Pipe

ATO Support

Brest Rail

Rump Rail

Kick Rail

Adjustable Jersey-Holstein 48" - 54"

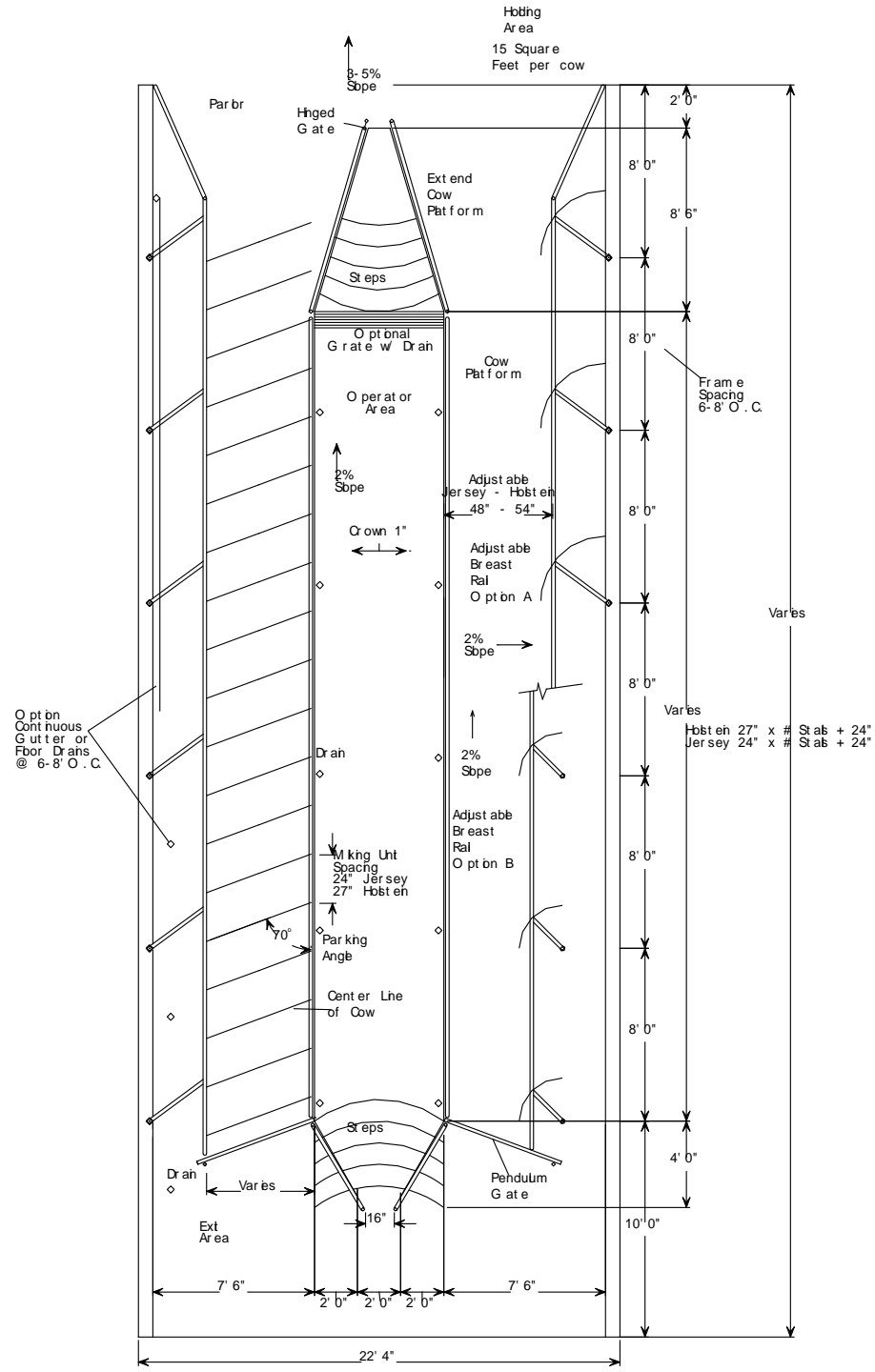
1/2"x8" anchor bolt

0' 6" Minimum

Chamfer Corner

1" Crown

Note** 12" Steel Development Length on all bars







Strategies to Manage a Small Budget “Milking System”

- Recycle and use existing milking system in different configuration
 - Swing line milking system
 - Use existing milking units
 - Use existing automatic takeoffs
- Buy good used milking system
- Buy economical milking system
 - Upgrade at a later time when cash is available
- Add new technology at a later time
 - Low Line
 - Additional units
 - ATO
 - RFID

Table 2. Milk Line Size and Number of Milking Units Used for a Careful Operator. (Transient air admission of 3.5 ft³/min. per milkline slope.)

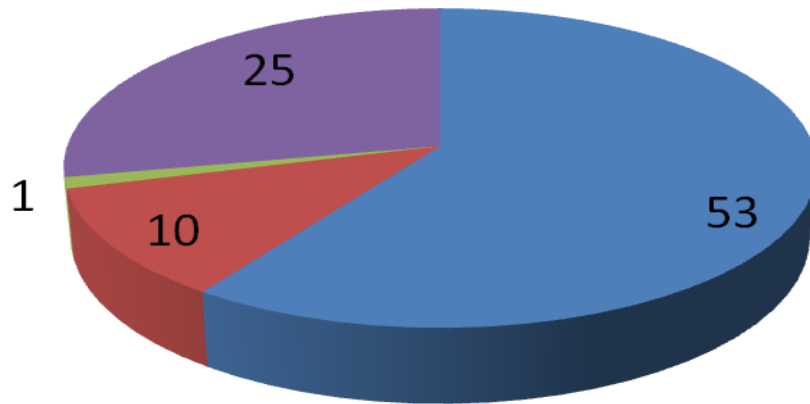
Looped Milk Line with Milking Units Attached Simultaneously by Careful Operator					
Nominal Line Size	Milk line Slope (%)				
	0.8 %	1.0 %	1.2 %	1.5 %	2.0 %
	Maximum Number of Milking Units/Slope				
2 inch	2	3	3	4	5
2.5 inch	6	6	7	9	10
3 inch	11	13	14	16	19
4 inch	27	30	34	38	45

Note: A slope of 0.8 % is equivalent to 1" drop in 10'. A slope of 1.2 % is equivalent to 1½" drop in 10'. Milk line slopes greater than 1.6 % (2" per 10') are not recommended unless the cow platform is sloped in the same direction as the milk line. Table from ASAE S518.2 July 1996.

New vs. Used

Milking Parlor Stalls

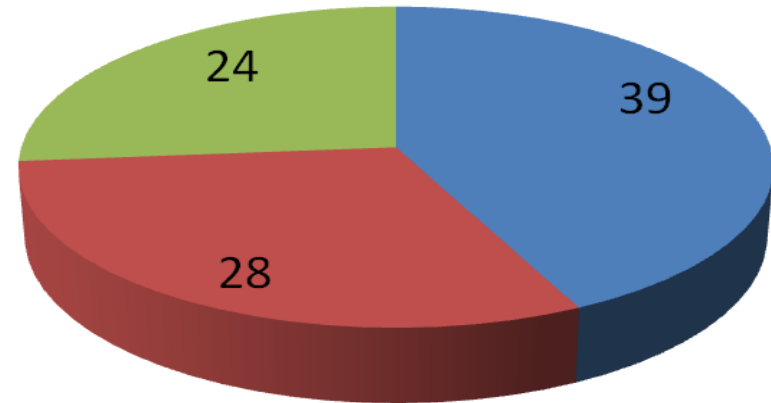
■ New ■ Used
■ Combination ■ Home Built



n = 89

Milking Equipment

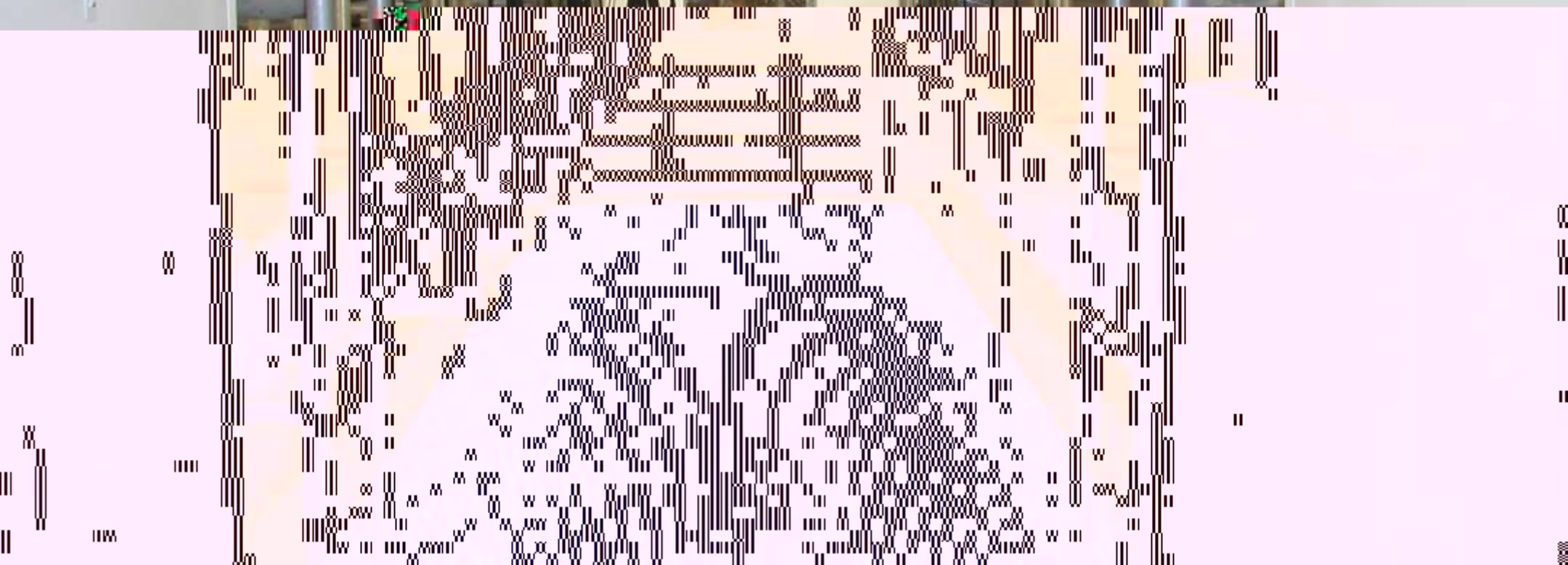
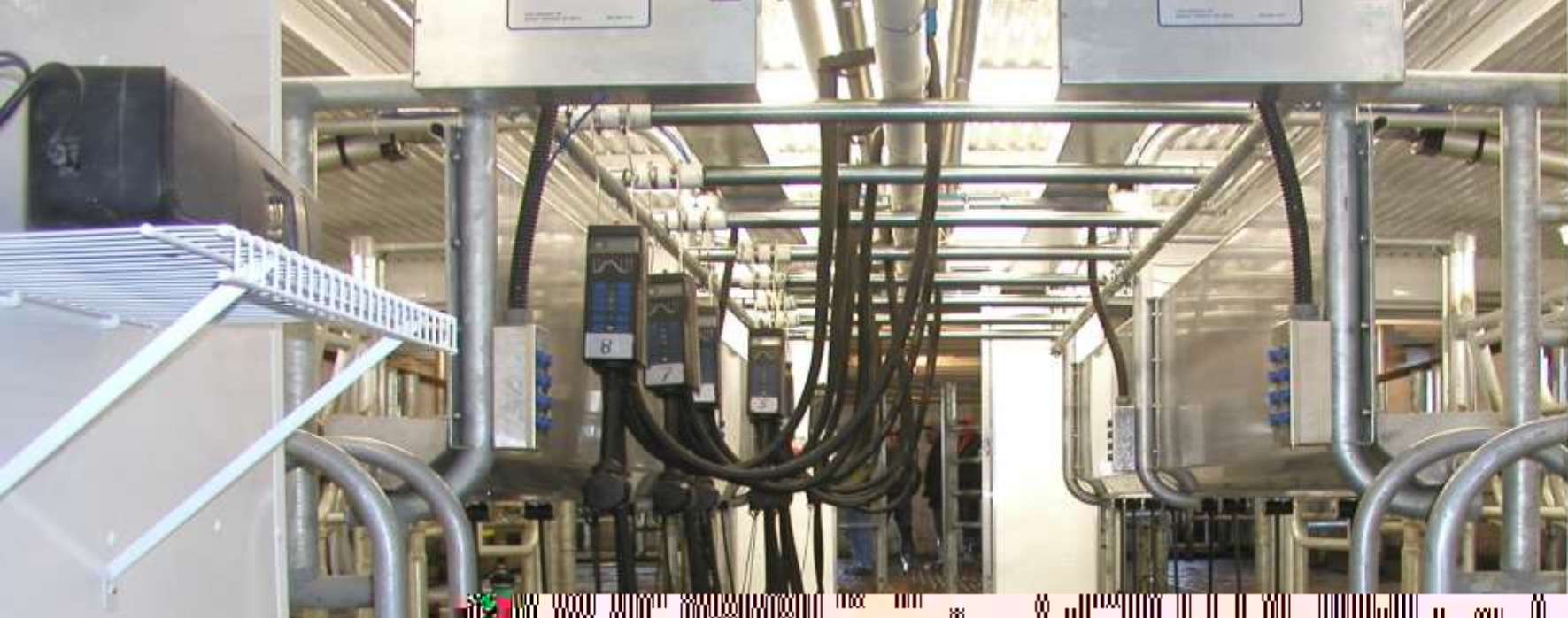
■ New ■ Used ■ Combination



n = 91









Strategies to Manage a Small Budget

“Receiver Group Location and Storage and Cleaning of Milking Units”

- No need to finish interior of parlor
 - Receiver group location in milk house space
 - Mini milk house in parlor
 - Store and Clean milking units in milk house space
 - Dry Parlor



Receiver Group in Milk House




Receiver Group in Milk House



Clean Units in Milk House

Mini milk house





**Low Line
Receiver Group
In Parlor**



Dry Parlor

Strategies to Manage a Small Budget

“Receiver Group Location and Storage and Cleaning of Milking Units”

- Milk house grade finishes in parlor space
 - Receiver group location in parlor space
 - High Line
 - Low Line
 - Store and clean milking units in parlor space



Receiver Group in Parlor
Mid High Line

03/21/2011

A photograph of a receiver group in a parlor low line. The equipment consists of two stainless steel receivers connected by a network of pipes. A white vertical pipe is attached to the left receiver. A large black hose is connected to the right receiver. The system is located in a room with a metal grate floor and a white wall. A blue valve handle is visible on a pipe to the right. A red tool with a blue handle is partially visible on the right side of the frame.

Receiver group in Parlor
Low Line



Clean Units in
Parlor



Clean Units in
Parlor

Clean Units in
Parlor

03/21/2011



Strategies to Manage a Small Budget “Sweat Equity”

- Use the skills you have
 - Demolition
 - Carpentry
 - Welding
 - Concrete
- Neighbors and friends
 - (Parlor raising)

A spiral-bound notebook with a light-colored, textured cover. The spiral binding is on the left side. The text is centered on the cover.

Low Cost Parlor

It can be done!

It has been done!

Think outside the box

- Calculate how many cows it will take to pay for a new parlor
- Calculate a parlor budget based on the number of cows you want

\$1,000 Parlor

\$1,000 Truck



\$17,000 Parlor

\$17,000 Truck



\$25,000 Parlor

\$25,000 Truck



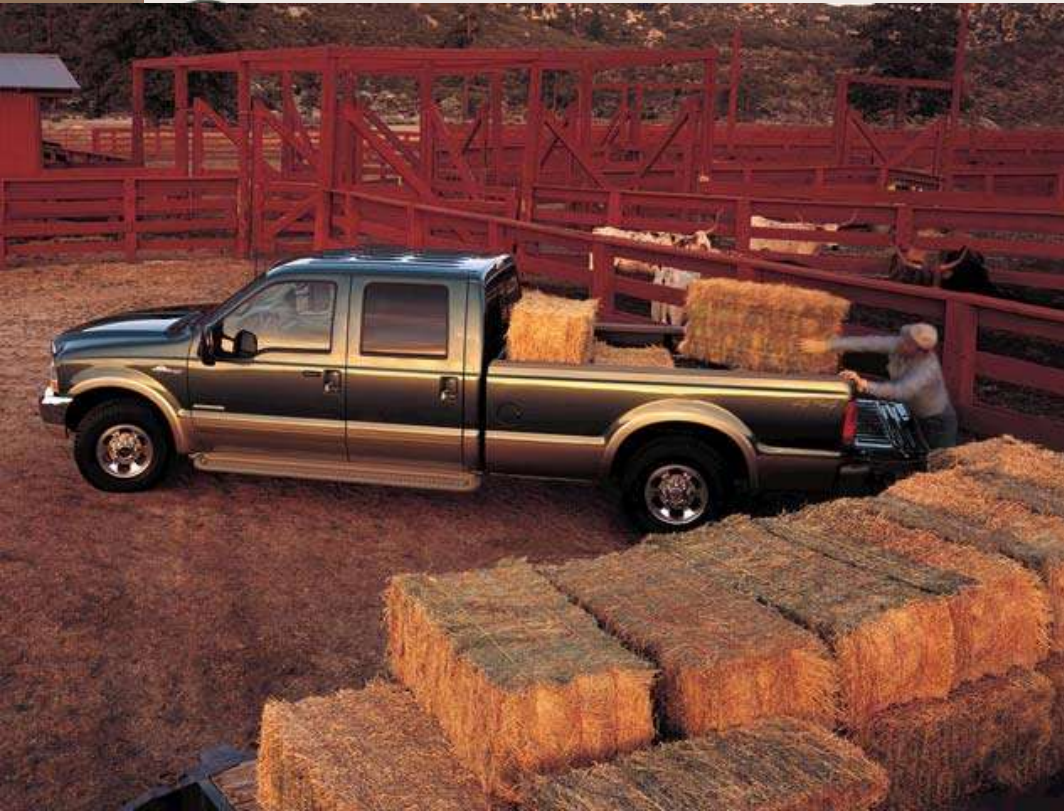
\$30,000 Parlor

\$30,000 Truck



\$50,000 Parlor

\$50,000 Truck



\$70,000 Parlor

\$70,000 Truck



\$100,000 Parlor

\$100,000 Truck



\$150,000 Parlor

\$150,000 Truck?



\$500,000 Parlor

\$500,000 Truck?



Challenges to Keep Cost Low

- **No plan or design work**
- **Know what you want (Meet your goals)**
- **You are in charge, (It won't just happen)**
- **Visit and milk in a similarly designed parlor**
- **Find an equipment dealer that is willing to work with you**
- **Find contractors that are willing to work with you**



Goodbye!