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## University of Wisconsin-Extension Dairy Team

### Building Cost Estimates-Dairy Modernization

Dairy modernization is defined here as the investment in facilities and technology to provide animal comfort and express the genetic potential of the herd to produce milk at a profit. Many farms are evolving from the tie/stanchion barn systems to a freestall or bedded pen barn and milking center. The range of project investments is large. One farm may need to remodel a building for calves while another farm needs a new barn and parlor. In the planning process, developing a budget with an estimate of the specific investments is usually not known fully until the plans are developed. The cost estimates here are “ballpark” estimates for initial budgeting and decision purposes. It can help in the decision making process to know the approximate or “ballpark” costs for financial long range planning.



The information in this fact sheet is not a comprehensive list of facility and equipment costs. Costs have been gathered from discussions with dairy producers giving their estimated costs associated with their project. Other costs were collected by reviewing prices from suppliers. These costs may not reflect some of the out of pocket costs to complete a project nor the entire cost of the project. Some costs represent material costs only and do not include installation labor. Some costs such as plumbing and electrical installation are more difficult to quantify on a per square foot or per head basis. Costs are for 2015 and do not account for future inflation. Costs do not reflect the supply and demand cycle of the construction industry and the construction season.

Accurate costs can only be determined by obtaining competitive bids for equipment and buildings from suppliers and builders and should include materials, installation labor, and project management costs.

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Project	Estimated Cost per Unit
Calf barn (with warm room)	\$1,500 to \$2,000 per head
Heifer barn (bedded pack)	\$2,000 to \$3,000 per calf
Cow freestall barn, electric and plumbing not included	\$2,500 to \$3,000 per stall, or \$20 per square foot
Robotic milking system (includes buildings, robots, gates and 30 day manure storage)	\$12,000 to \$13,000 per stall
New parlors and buildings	\$24,000 to \$32,000 per milking stall
Retrofit parlors	\$3,000 to \$6,000 per milking stall
*Estimated value of existing building, milk house, electric, and plumbing for retrofit parlor	\$50,000 to \$75,000

Building Frame	Estimated Cost per Unit
Post frame roof, open front/no floor	\$9.00 per square foot
Materials 2015	\$5.60 per square foot
Construction labor	\$2.70 per square foot
Post frame with truss, posts in ground, 100' long, width ranges from 30' to 120'	\$7.00-\$12.00 per square foot
Additional 8' to 10' bay	\$6.00-\$9.00 per square foot
Post frame with truss posts on frost foundation 100' long, width ranges from 30' to	\$10.00-\$15.00 per square foot
Additional 8' to 10' bay	\$8.00-\$11.00 per square foot
Calf barn, 30' wide includes building frame, 20' wide concrete floor, curtains, and	\$10.00-\$12.00 per square foot
Heifer barn, open front 40' wide includes building frame, 25' wide concrete floor, curtains, and doors	\$16.50 per square foot
Freestall barn 70' to 120' wide includes building frame, concrete, curtains, doors, and stalls	\$15.00 per square foot
Post frame overhang	\$8.00 per square foot
Steel frame on pier foundation, 100' long	\$12.00 per square foot
Steel frame on frost foundation, 100' long	\$20.00 per square foot
Additional 20' bay	\$15.00 per square foot
Hoop structure (FarmTek®) includes materials only package, no concrete	\$4.00 per square foot
Hoop structure (FarmTek®) includes frame only with labor, no concrete	\$6.00 per square foot
2' x 6' stud frame wall (insulated)	\$25.00 per square foot
2' x 4' stud frame wall (uninsulated)	\$15.00 per square foot



Image source: UW-Madison, Department of Dairy Science

Shade/Shelter	Estimated Cost per Unit
Shade shelter pipe frame	
< 400 square foot	\$3.00 per square foot
< 1,600 square foot	\$2.00 per square foot
< 3,600 square foot	\$1.80 per square foot
< 10,000 square foot	\$1.40 per square foot
< 40,000 square foot	\$1.25 per square foot
Shade cloth, 16' roll	\$0.22 per square foot
Shade cloth panels, hemmed grommetted	\$0.40 per square foot
Windbreak shelter pipe frame, 10' high	\$20.00 per linear foot

Wall Sheathing	Estimated Cost per Unit
Painted steel corrugated	\$1.00 per square foot
Plastic corrugated flat panel (8mm thick)	\$1.50 per square foot
Plastic, $\frac{1}{16}$ " corrugated	\$1.00 per square foot
Plastic, $\frac{1}{8}$ " corrugated	\$1.75 per square foot
Plastic, $\frac{1}{4}$ " corrugated	\$3.25 per square foot
Polycarbonate	\$1.75 per square foot
OSB, $\frac{1}{2}$ " thick	\$0.60 per square foot

Roof Insulation	Estimated Cost per Unit
Bubble	\$0.50 per square foot
2" vinyl covered fiberglass, material only	\$0.60 per square foot
2" vinyl covered fiberglass, labor and material	\$1.25 per square foot
1" foil covered rigid board	\$0.75 per square foot
Dripex covering	\$1.00 per square foot

Concrete Walls and Floors	Estimated Cost per Unit
6" high curb with footing	\$24.00 per linear foot
12" high curb with footing	\$30.00 per linear foot
24" high curb with footing	\$33.00 per linear foot
8" x 4' wall with footing	\$56.00 per linear foot
8" x 5' wall with footing	\$72.00 per linear foot
8" x 6' wall with footing	\$87.00 per linear foot
8" x 8' wall with footing	\$123.00 per linear foot
8" x 6" curb on top of flat work	\$2.50 per linear foot
8" x 1' curb on top of flat work	\$5.00 per linear foot
8" x 2' curb on top of flat work	\$10.00 per linear foot
5" flatwork #3 rebar ( $\frac{3}{8}$ " diameter), 18" on center	\$3.60 per square foot
5" flatwork #4 rebar ( $\frac{1}{2}$ " diameter), 18" on center	\$4.00 per square foot
4" concrete with welded wire mesh	\$2.75 per square foot
Concrete, material only	\$100 per cubic yard
Concrete, labor and material	\$200 per cubic yard
Saw concrete	\$7.60 per linear foot
Concrete flat work removal	\$1.80 per square foot

Calf Pens	Estimated Cost per Unit
Calf pen 4' x 7', plastic	\$500 each
Calf hutch, individual	\$250 each
Calf transition group hutch (4 calves)	\$650 each
Double pail holder	\$20 each
Pail	\$10 each

Pens and Stall Work	Estimated Cost per Unit
Freestall partition/neck rail	\$100 each
Rubber flooring, 1/2" thick	\$2.50 per square foot
Fiberglass post and rod gates or fence	\$12.50 per linear foot
Steel tube gates or fence	\$7.50 per linear foot
4" x 7' galvanized steel post	\$100 each
6" x 8" x 8' treated wood post	\$54 each
Mattress	\$300-\$500 each

Feeding System	Estimated Cost per Unit
Flat floor, 3' wide with 21" high curb, posts 10' on center, and feed rail barrier	\$30 per linear foot
Precast concrete J-bunk	\$25 per linear foot
Precast concrete H-bunk	\$25 per linear foot
Headlocks	\$40-\$45 per linear foot
Diagonal bar feeder barrier	\$36 per linear foot
Mechanical bunk feeder	\$100 per linear foot
Mechanical conveyor	\$75 per linear foot
Round bale feeder	\$400 each
Feeder wagon on running gear, feed on both sides	\$140 per linear foot
Portable steel feed bunk, feed on both sides	\$50 per linear foot

Feed Storage	Estimated Cost per Unit
Vertical silo	\$1.40 per cubic foot
Horizontal silo concrete walls	\$0.52 per cubic foot
5" concrete feed storage pad with #4 rebar (1/2"), 18" on center	\$4.00 per square foot
Asphalt feed storage pad	\$2.30 per square foot
Bulk feed bin	
3 ton	\$1,200 each
6 ton	\$1,500 each
9 ton	\$2,200 each
12 ton	\$3,000 each

Doors	Estimated Cost per Unit
3'x 7' personal door steel/fiberglass	\$400 each
Slider	\$5.00 per square foot
Overhead	\$9.00 per square foot
Door opener, large door	\$800 each
Door opener, small door	\$400 each

Ventilation	Estimated Cost per Unit
<b>Covered Ridge</b>	\$10.00 per linear foot
<b>Curtain Gathered</b>	
4' wide rollup	\$13.50 per linear foot
6' wide rollup	\$16.50 per linear foot
8' wide rollup	\$18.00 per linear foot
Welded wire panel protection for curtain	\$0.50 per square foot
<b>Panel Fans</b>	
3' diameter panel fan	\$500 each
4' diameter panel fan	\$700 each
<b>Exhaust Fans (in wall)</b>	
12" diameter	\$350 each
18" diameter	\$600 each
24" diameter	\$700 each
36" diameter	\$800 each
48" diameter	\$1,000 each
<b>Tunnel Ventilation Fans with Cone</b>	
24" diameter	\$650 each
36" diameter	\$1,300 each
48" diameter	\$1,500 each
<b>Large Diameter 20' Paddle Fan (High Volume Low Speed, HVLS)</b>	\$6,000 each
<b>Ceiling Fan 5' Diameter</b>	\$200 each

Positive Pressure Tube System	Estimated Cost per Unit	
	Plastic Tube	Fan
12" diameter	\$3.50 per linear foot	\$400 each
18" diameter	\$3.75 per linear foot	\$425 each
24" diameter	\$4.00 per linear foot	\$500 each
36" diameter	\$5.00 per linear foot	\$600 each



Waterer (Frost Free)	Cost per Unit	Water Tanks	Cost per Unit
24" long	\$500 each	50 gallon	\$100 each
36" long	\$700 each	100 gallon	\$125 each
48" long	\$800 each	300 gallon	\$200 each
72" long	\$900 each	600 gallon	\$300 each
84" long	\$1,100 each		

Excavation	Cost per Unit
Excavation for site preparation	\$4.00 per square foot or \$3.00 per cubic yard
Top soil stripping	\$2.20 per cubic yard
Earth fill, on site	\$3.00 per cubic yard
Lane with screenings, 16' wide	\$6.00 per linear foot
4" crushed stone (from off site)	\$12.50 per cubic yard
Grass waterway	\$3.75 per linear foot

Manure Storage	Cost per Unit
Concrete stacking pad with buck wall	\$3.50 per square foot
Slatted floor tank under shelter	\$1.50 per cubic foot
Concrete vertical wall tank	\$0.90 per cubic foot
Clay lined lagoon	\$36,000 + \$0.08 per cubic foot
Concrete lined lagoon	\$47,500 + \$0.50 per cubic foot
18" double wall corrugated HDPE (installed)	\$19.00 per linear foot
24" double wall corrugated HDPE (installed)	\$30.00 per linear foot
1" diameter water line, installed below ground	\$2.00 per linear foot
4' deep huffcut channel	\$93 per linear foot
4' deep huffcut channel with lid	\$150 per linear foot
8' x 8' x 8' concrete transfer tank with lid	\$5,000 each

Manure Handling Equipment	Cost per Unit
Chopper pump	\$11,000 each
Piston pump	\$18,000 each
Vertical piston pump	\$27,000 each
Agitator	\$6,000 each

Runoff Control	Cost per Unit
Vegetative treatment area	\$1,000 per acre

For additional extension resources regarding dairy modernization, please visit <http://fyi.uwex.edu/dairy>