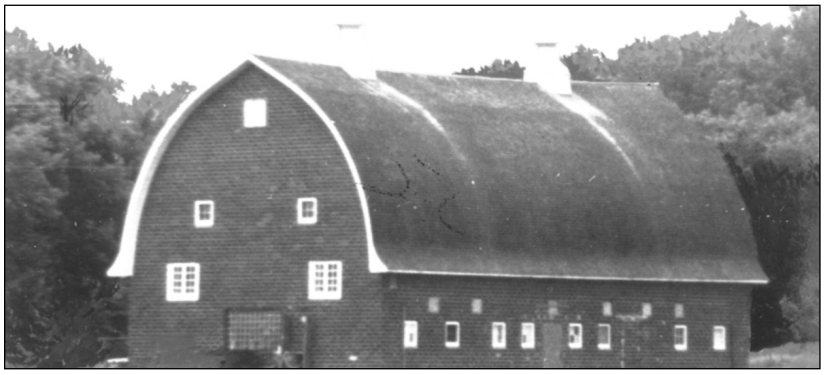
BARNS

EXCELLENT CLASS D

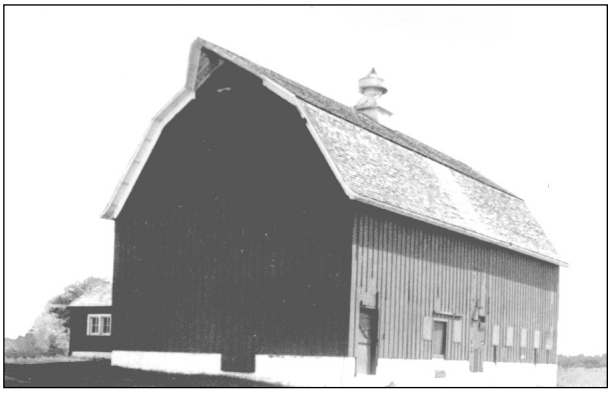


EXCELLENT / GOOD CLASS C

GOOD CLASS D

GOOD / AVERAGE CLASS D

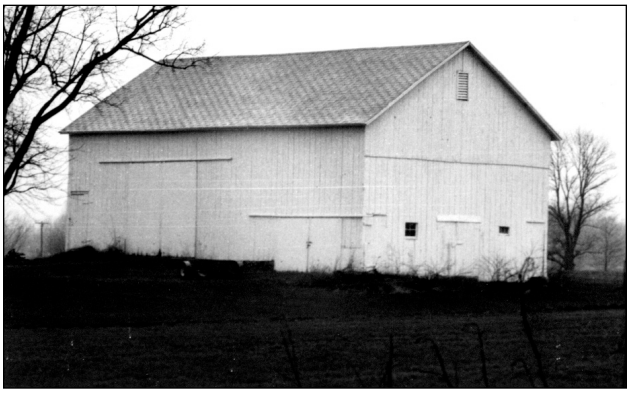
GOOD / AVERAGE CLASSES C AND D



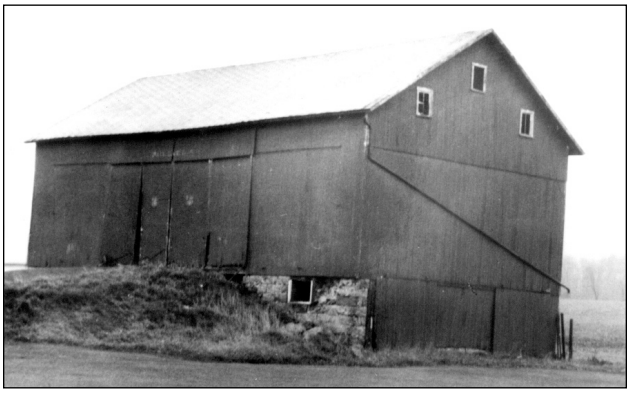
AVERAGE CLASS D

BARNS

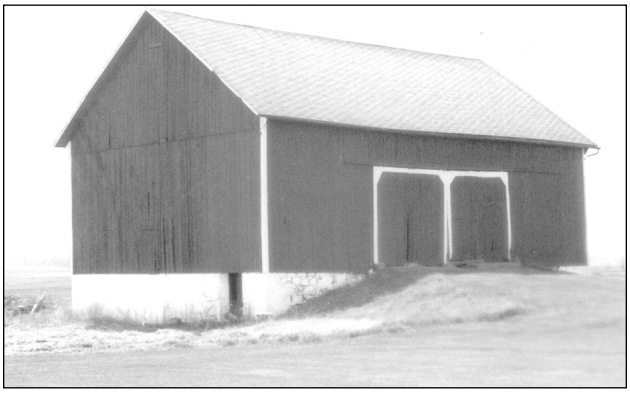
AVERAGE CLASS D



LOW-COST / AVERAGE CLASS D
Barn with Gable Roof

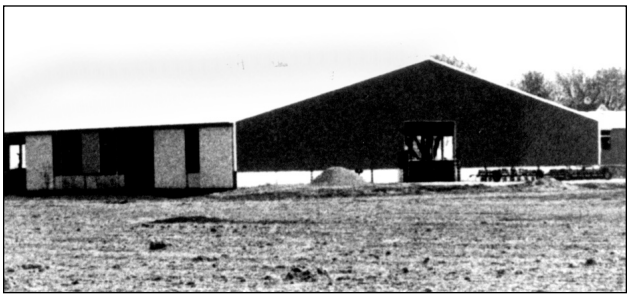


LOW-COST / AVERAGE CLASS D
Bank Barn with Gable Roof



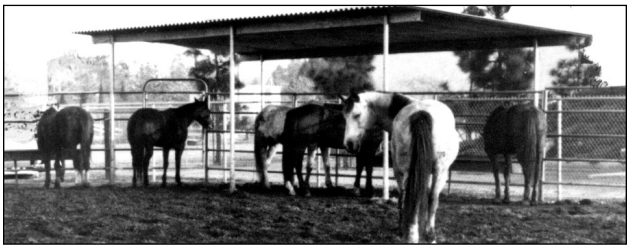
LOW-COST CLASS D
Bank Barn with Gable Roof

AVERAGE CLASS S FREESTALL



LOW-COST CLASS DPOLE FREESTALL BARN

AVERAGE CLASS D HAY OR LIVESTOCK SHELTER



LOW-COST CLASS S SHELTER

BARNS

OCCUPANCY DESCRIPTION: Multipurpose barn buildings that may include livestock stalls, hay/grain storage. Common "flat roofed" types are gable and shed roofs, which allow for loft areas. Higher-quality barns include lighting, water service and concrete floor systems. Lower-quality barns may have dirt floors.

Barn loft costs include the floor structure and supports only; height adjustments must usually be made.

Confinement barns are large enclosed structures providing for the housing of cattle. The low quality structures have dirt floors and natural ventilated sidewalls. The average quality structures are environmental barns with feed areas and include some concrete alleyways.

INCLUDED IN COSTS: Architects' fees and contractors' overhead and profit.

NOT INCLUDED IN COSTS: Barn loft floors, heating systems and feed and cleaning equipment are not included.

BARNS – GENERAL PURPOSE

CLASS	TYPE	COST/ SQ. FT.	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING & PLUMBING
C	Good	$26.45	Block or structural tile, some windows, good gable roof and trim	Concrete floor, stalls and feed room	Adequate lights and outlets, water service and drains
	Average	20.15	Brick, concrete block, structural clay tile, few windows, "flat roofed"	Unfinished, some slab or wood floor, stalls	Few electrical outlets and hose bibs
	Low cost	15.40	Concrete block, light shed or gable roof, asphalt shingles	Unfinished, dirt floor, few cheap stalls	None
D	Good	23.25	Lap siding, windows, good frame and gable roof structure	Some wainscot, plank or concrete floors, stalls, feed room	Adequate lights and outlets, water service, drains
	Average	16.80	Wood frame, board and batten or low-cost siding, few windows	Some floor, few partitions and stalls, feed room	Few electrical outlets and hose bibs
	Low cost	12.20	Light wood frame and shed or gable roof structure, board siding	Unfinished, dirt floor, few cheap stalls	None
DPOLE	Good	19.80	Pole frame, metal siding, insulated, good gable roof and trim	Concrete or plank floors, stalls, feed room, interior sheathing	Adequate lights and outlets, water service and drains
	Average	14.15	Pole frame, metal siding, few windows or shutters, "flat roofed"	Some floor, few partitions and stalls, feed room	Few electrical outlets and hose bibs
	Low cost	10.10	Pole frame, metal siding, light roof	Unfin., dirt floor, few cheap stalls	None
S	Good	21.10	Steel panels on steel frame, insulated, good gable roof and trim	Plank or concrete floors, stalls, feed room, interior sheathing	Adequate lights and outlets, water service and drains
	Average	15.30	Steel siding and frame, few windows or shutters, "flat roofed"	Some floor, few partitions and stalls, feed room	Few electrical outlets and hose bibs
	Low cost	11.15	Steel siding and frame, light roof	Unfin. dirt floor, few cheap stalls	None

Stalls cost $.52 to $3.15 with stall equipment (feed and water not automated) at $.26 to $1.30 per square foot of equipped area. Add for barn cleaner at $3.35 to $5.00 per square foot of area served.

HAYLOFTS

CDS	Good	$ 9.05	Not included	Heavy timber, good T&G or plank	Not included
	Average	5.85	Not included	Adequate support, plank floor	Not included
	Low cost	3.80	Not included	Minimum support, light floor	Not included

For wall height adjustment on buildings with high-pitched roofs, use the height to the eaves plus one-half the distance from the eaves to the ridge for the effective wall height with which to enter the story height multiplier table. For an example, see page 212.

CONFINEMENT BARNS

C	Average	$15.00	Wood siding and frame, fully insulated and ventilated	Some paved alleyways, wainscot, dirt stalls, or pens	Adequate lighting and water service
	Low cost	7.50	Boards and plywood, on box frame, some insulation, curtains or vents	Unfinished, dirt floor	Minimum lighting and water service
DPOLE	Average	13.25	Pole frame, metal siding, fully insulated, ventilated	Some paved alleyways, wainscot, dirt stalls, or pens	Adequate lighting and water service
	Low cost	6.40	Pole frame, metal siding, some insulation, side curtains or vents	Unfinished, dirt floor	Minimum lighting and water service
DHOOP ARCH	Low cost	4.65	Wood post, knee wall, pipe hoop frame, fabric cover, end curtains	Some wainscot, dirt floor, claf pens	Minimum water service, feed, not automated
S	Average	14.10	Steel panels and frame, fully insulated, ventilated	Some paved alleyways, wainscot, dirt stalls, or pens	Adequate lighting and water service
	Low cost	7.40	Steel siding and frame, some insulation, side curtains or vents	Unfinished, dirt floor	Minimum lighting and water service

For slotted floors, add the following per square foot of pit area:

Shallow pit, scraper alley: $4.75 to $9.75. Deep pit, tractor access: $11.50 to $16.50.

BARNS

REFINEMENTS: On this page are the means of making major adjustments to the base costs on the previous page. Follow Steps 1 through 5 to attain final costs, adjusted for lump sums, heating and cooling, story height, floor area/perimeter ratio and locality.

1

ADJUSTMENTS

Stalls, each, free: $55 – $120; tie: $95 – $140; box: $450 – $925; calf pen, steel: $260 - $300; wire: $25 – $50

Feed racks, per linear foot: $12.50 – $17.00; steel feeders, each: paddock, $500; bale, $450; bunk, $400

Mechanical feeder, per linear foot, trough auger: $68 - $95; chain feeder: $62 – $90; overhead: $95 – $125

Water troughs, per linear foot, steel: $16.25 – $24.75; concrete: $24.75 – $36.50; drinking bowls, each: $85 – $100

Automatic waterers, each: $120 – $200

Barn cleaner, elevator and drive: $5,300 – $8,300 plus $36 per linear foot of gutter

2

HEATING AND COOLING

These costs are averages of total installed cost of the entire heating or cooling installation including its prorated share of contractors' overhead and profit and architects' fees.

Electric cable or baseboard	$2.90
Electric wall heaters (inc. FWA)	1.25
Forced air, ducted	3.20
heaters or furnace, vented	.95
Hot water, baseboard/convector	5.85
radiant floor or ceiling	6.05
Space heaters, with fan	1.60
radiant	1.80
Steam	5.05
Wall or floor furnace	1.45
Package heating and cooling	6.30
Ventilation, blower and ducts	.95
fans only	.40

3

HEIGHT REFINEMENTS

STORY HEIGHT MULTIPLIERS

Multiply base cost by following multiplier for any variation in average story height.

Average Wall Height	Square Foot Multiplier
8	.963
9	.981
10	1.000
11	1.019
12	1.038
13	1.058
14	1.077
16	1.115
18	1.154
20	1.192
22	1.231
24	1.269
28	1.346
32	1.423
36	1.500

4

Average Floor Area, Sq. Ft./Story	AVERAGE PERIMETER														Average Floor Area, Sq. Ft./Story
	125	200	250	300	350	400	450	500	550	600	700	800	900	1000	
1,000	1.10	1.29	1.42	1.54	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	**1,000**
2,000	.95	1.04	1.10	1.17	1.23	1.29	1.35	-----	-----	-----	-----	-----	-----	-----	**2,000**
3,000	.90	.96	1.00	1.04	1.08	1.12	1.17	1.21	1.25	1.29	-----	-----	-----	-----	**3,000**
4,000	.87	.92	.95	.98	1.01	1.04	1.07	1.10	1.13	1.17	1.23	1.29	-----	-----	**4,000**
5,000	-----	.89	.92	.94	.97	.99	1.02	1.04	1.07	1.09	1.14	1.19	1.20	-----	**5,000**
6,000	-----	.87	.90	.92	.94	.96	.98	1.00	1.02	1.04	1.08	1.12	1.17	1.21	**6,000**
7,000	-----	.86	.88	.90	.92	.93	.95	.97	.99	1.01	1.04	1.08	1.11	1.15	**7,000**
8,000	-----	.85	.87	.88	.90	.92	.93	.95	.96	.98	1.01	1.04	1.07	1.10	**8,000**
9,000	-----	-----	.86	.87	.89	.90	.92	.93	.94	.96	.99	1.01	1.04	1.07	**9,000**
10,000	-----	-----	.85	.86	.88	.89	.90	.92	.93	.94	.97	.99	1.02	1.04	**10,000**
11,000	-----	-----	.84	.85	.87	.88	.89	.91	.92	.93	.95	.97	1.00	1.02	**11,000**
12,000	-----	-----	.84	.85	.86	.88	.89	.90	.91	.92	.94	.96	.98	1.00	**12,000**
14,000	-----	-----	.83	.84	.85	.86	.87	.88	.89	.90	.92	.93	.95	.97	**14,000**

5 **USE COUNTY MULTIPLIERS IN MULTIPLIER SECTION.**

BARNS

OCCUPANCY DESCRIPTION: Bank barns are two-story multipurpose buildings that may include livestock stalls, hay/grain storage. Common flat roof types are gable and shed, which allow for additional loft areas. Higher-quality barns include lighting, water service, and plank or concrete floor systems. Lower-quality barns may have dirt floors on the lower level.

Barn loft costs include the floor structure and supports only; height adjustments must usually be made.

INCLUDED IN COSTS: Architects' fees and contractors' overhead and profit.

NOT INCLUDED IN COSTS: Barn loft floors, heating systems and feed and cleaning equipment are not included.

BARNS – BANK (TWO-STORY) – GENERAL PURPOSE

CLASS	TYPE	COST/ SQ. FT.	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING & PLUMBING
C	Good	$19.10	Block or structural tile, some windows, good gable roof and trim	Concrete, good plank floors, stalls and feed room	Adequate lights and outlets, water service and drains
	Average	14.65	Brick, concrete block, structural clay tile, few windows, "flat roofed"	Some slab, wood floor, some partitions and stalls, feed room	Minimum electrical and water outlets
	Low cost	11.25	Concrete block, structural clay tile, light shed or gable roof	Unfinished, dirt floor, upper-level wood floor, few stalls	None
D	Good	17.30	Lap siding, windows, good frame and gable roof structure	Some wainscot, good plank and concrete floors, stalls, feed room	Adequate lights and outlets, water service, drains
	Average	12.80	Wood frame, board and batten or low-cost siding, few windows	Some slab, wood floor, some partitions and stalls, feed room	Minimum electrical and water outlets
	Low cost	9.45	Light wood frame and shed or gable roof structure, board siding	Unfinished, dirt floor, upper-level wood floor, few stalls	None
DPOLE	Good	15.35	Pole frame, metal siding, insulated, good gable roof and trim	Concrete and plank floors, stalls, feed room, interior sheathing	Adequate lights and outlets, water service and drains
	Average	11.30	Pole frame, metal siding, few windows or shutters, "flat roofed"	Some slab, wood floor, some partitions and stalls, feed room	Minimum electrical and water outlets
	Low cost	8.35	Pole frame, metal siding, light roof	Unfin., dirt, wood floors, few stalls	None

Stalls cost $.52 to $3.15 with stall equipment (feed and water not automated) at $.26 to $1.30 per square foot of equipped area. Add for barn cleaner at $3.35 to $5.00 per square foot of area service.

HAYLOFTS

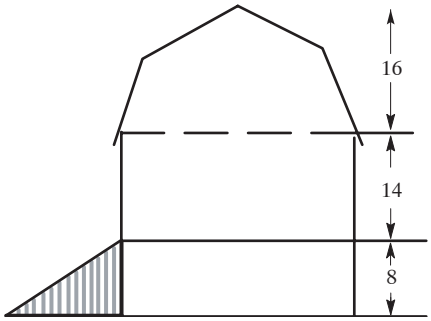
CDS	Good	$9.05	Not included	Heavy timber, good T&G or plank	Not included
	Average	5.85	Not included	Adequate support, plank floor	Not included
	Low cost	3.80	Not included	Minimum support, light floor	Not included

For wall height adjustment on buildings with high-pitched roofs, use the height from the floor to the eaves plus one-half the distance from the eaves to the ridge for the effective wall height with which to enter the story height multiplier table.

EXAMPLE:

Apply costs to total floor (both floors).

Apply loft costs to additional loft floor area.



8' + 14' + (1/2 x 16') = 30' ÷ 2 stories = 15' EFFECTIVE WALL HEIGHT

BARNS

REFINEMENTS: On this page are the means of making major adjustments to the base costs on the previous page. Follow Steps 1 through 5 to attain final costs, adjusted for lump sums, heating and cooling, story height, floor area/perimeter ratio and locality.

1 **ADJUSTMENTS**

Stalls, each, free: $55 – $120; tie: $95 – $140; box: $450 – $925; calf pen, steel: $260 – $300; wire: $25 – $50

Feed racks, per linear foot: $12.50 – $17.00; steel feeders, each: paddock, $500; bale, $450; bunk, $400

Mechanical feeder, per linear foot, trough auger: $68 – $95; chain feeder: $62 – $90; overhead: $95 – $125

Water troughs, per linear foot, steel: $16.25 – $24.75; concrete: $24.75 – $36.50; drinking bowls, each: $85 – $100

Automatic waterers, each: $120 – $200

Barn cleaner, elevator and drive: $5,300 – $8,300 plus $36 per linear foot of gutter

Loft access ramps, each: $650 – $1,075

2 **HEATING AND COOLING**

These costs are averages of total installed cost of the entire heating or cooling installation including its prorated share of contractors' overhead and profit and architects' fees.

Electric cable or baseboard	$2.90
Electric wall heaters (inc. FWA)	1.25
Forced air, ducted	3.20
heaters or furnace, vented	.95
Hot water, baseboard/convector	5.85
radiant floor or ceiling	6.05
Space heaters, with fan	1.60
radiant	1.80
Steam	5.05
Wall or floor furnace	1.45
Package heating and cooling	6.30
Ventilation, blower and ducts	.95
fans only	.40

3 **HEIGHT REFINEMENTS**

STORY HEIGHT MULTIPLIERS

Multiply base cost by following multiplier for any variation in average story height.

Average Wall Height	Square Foot Multiplier
8	.963
9	.981
10	1.000
11	1.019
12	1.038
13	1.058
14	1.077
16	1.115
18	1.154
20	1.192
22	1.231
24	1.269
28	1.346
32	1.423

4

Average Floor Area, Sq. Ft./Story	AVERAGE PERIMETER														Average Floor Area, Sq. Ft./Story
	125	200	250	300	350	400	450	500	550	600	700	800	900	1000	
1,000	1.10	1.29	1.42	1.54	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	**1,000**
2,000	.95	1.04	1.10	1.17	1.23	1.29	1.35	-----	-----	-----	-----	-----	-----	-----	**2,000**
3,000	.90	.96	1.00	1.04	1.08	1.12	1.17	1.21	1.25	1.29	-----	-----	-----	-----	**3,000**
4,000	.87	.92	.95	.98	1.01	1.04	1.07	1.10	1.13	1.17	1.23	1.29	-----	-----	**4,000**
5,000	-----	.89	.92	.94	.97	.99	1.02	1.04	1.07	1.09	1.14	1.19	1.20	-----	**5,000**
6,000	-----	.87	.90	.92	.94	.96	.98	1.00	1.02	1.04	1.08	1.12	1.17	1.21	**6,000**
7,000	-----	.86	.88	.90	.92	.93	.95	.97	.99	1.01	1.04	1.08	1.11	1.15	**7,000**
8,000	-----	.85	.87	.88	.90	.92	.93	.95	.96	.98	1.01	1.04	1.07	1.10	**8,000**
9,000	-----	-----	.86	.87	.89	.90	.92	.93	.94	.96	.99	1.01	1.04	1.07	**9,000**
10,000	-----	-----	.85	.86	.88	.89	.90	.92	.93	.94	.97	.99	1.02	1.04	**10,000**
11,000	-----	-----	.84	.85	.87	.88	.89	.91	.92	.93	.95	.97	1.00	1.02	**11,000**
12,000	-----	-----	.84	.85	.86	.88	.89	.90	.91	.92	.94	.96	.98	1.00	**12,000**
14,000	-----	-----	.83	.84	.85	.86	.87	.88	.89	.90	.92	.93	.95	.97	**14,000**

5 **USE COUNTY MULTIPLIERS IN MULTIPLIER SECTION.**

BARNS

OCCUPANCY DESCRIPTION: Special purpose dairy barn buildings that may include livestock stalls, hay/grain storage. Common roof types are gambrel and gothic, which allow for loft areas. Higher-quality barns include lighting, plumbing, interior partitions, and milk processing and storage. Lower-quality barns are older milking barns only.

Barn loft costs include the floor structure and supports only; height adjustments must usually be made.

INCLUDED IN COSTS: Architects' fees and contractors' overhead and profit.

NOT INCLUDED IN COSTS: Barn loft floors, heating systems and feed, milking and cleaning equipment are not included.

BARNS – SPECIAL PURPOSE

CLASS	TYPE	COST/ SQ. FT.	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING & PLUMBING
C	Excellent	$46.15	Decorative block, tile, arches, cupolas, gambrel roof, dormers	Plaster wainscot in cooler and washroom, good concrete floor	Good lighting and plumbing, hot water, milk piping
	Good	35.10	Brick or block, good fenestration, good gambrel roof and trim	Painted, concrete floor, good stalls and dairy facilities, storage	Good wiring, water and power outlets, restroom
	Average	26.70	Block or structural tile, some windows, arch or gambrel roof	Concrete floor, stalls and feed room, good milking	Lighting and power wiring, water service and drains
	Low cost	20.40	Brick, concrete block, structural clay tile, good gable or light gambrel	Unfinished, some slab or wood floor, few stalls, feed room, milk barn only	Adequate electrical and water outlets
D	Excellent	43.95	Best sidings or veneer, good gambrel roof, arches, cupolas, dormers	Plaster wainscot in cooler and washroom, good concrete floor	Good lighting and plumbing, hot water, milk piping
	Good	32.50	Good siding or brick veneer, heavy frame and roof structure	T&G wainscot, concrete floor, good stalls and dairy facilities, storage	Good wiring, water and power outlets, restroom
	Average	24.10	Lap siding, windows, heavy frame and roof structure, gambrel roof	Some wainscot, plank or concrete floors, stalls, feed room, good milking	Lighting and power wiring, water service and drains
	Low cost	17.95	Wood frame, board and batten or siding, few windows, gable roof	Some floor, few partitions and stalls, feed room, milking barn only	Adequate electrical and water outlets
DPOLE	Average	20.75	Pole frame, metal siding, insulated, good arch or gambrel-style roof	Concrete or plank floors, stalls, feed room, interior sheathing	Lighting and power wiring, water service and drains
	Low cost	15.20	Pole frame, metal siding, few windows or shutters, good gable roof	Some floor, few partitions and stalls, feed room, milking barn only	Adequate electrical and water outlets

HAYLOFTS

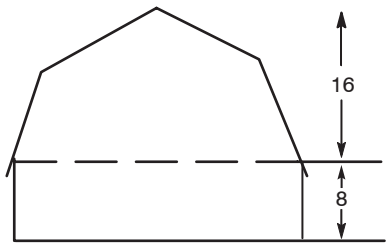
CDS	Good	$9.05	Not included	Heavy timber, good T&G or plank	Not included
	Average	5.85	Not included	Adequate support, plank floor	Not included
	Low cost	3.80	Not included	Minimum support, light floor	Not included

For wall height adjustment on buildings with high-pitched roofs, use the height to the eaves plus one-half the distance from the eaves to the ridge for the effective wall height with which to enter the story height multiplier table.

EXAMPLE:

Apply costs to total floor (both floors).

Apply loft costs to additional loft floor area.



8' + 1/2 x 16' = 16' = EFFECTIVE WALL HEIGHT

BARNS

REFINEMENTS: On this page are the means of making major adjustments to the base costs on the previous page. Follow Steps 1 through 5 to attain final costs, adjusted for lump sums, heating and cooling, story height, floor area/perimeter ratio and locality.

1

ADJUSTMENTS

Stalls, each, free: $55 – $120; tie: $95 – $140; box: $450 – $925; calf pen, steel: $260 – $300; wire: $25 – $50

Feed racks, per linear foot: $12.50 – $17.00; steel feeders, each: paddock, $500; bale, $450; bunk, $400

Mechanical feeder, per linear foot, trough auger: $68 – $95; chain feeder: $62 – $90; overhead: $95 – $125

Water troughs, per linear foot, steel: $16.25 – $24.75; concrete: $24.75 – $36.50; drinking bowls, each: $85 – $100

Barn cleaner, elevator and drive: $5,300 – $8,300 plus $36 per linear foot of gutter

Milking equipment: $7,250 – $12,500 base, plus $550 – $1,500 per stall, add for power gates, $750 – $900;
for feed system, add $550 – $700, plus $525 for auger, per stall;
for computerized automation, add $1,250 – $2,500 plus $30 – $45 for each I.D. tag

Bulk milk tanks, including refrigeration. For automatic wash system, add $1,850 to $2,400

Capacity, gal.	Cost	Capacity, gal.	Cost	Capacity, gal.	Cost
500	$13,000	1,500	$28,250	4,000	$56,750
750	17,250	2,000	34,750	5,000	66,250
1,000	21,250	3,000	46,250	8,000	92,500

2

HEATING AND COOLING

These costs are averages of total installed cost of the entire heating or cooling installation including its prorated share of contractors' overhead and profit and architects' fees.

Electric cable or baseboard	$2.90
Electric wall heaters (inc. FWA)	1.25
Forced air, ducted	3.20
heaters or furnace, vented	.95
Hot water, baseboard/convector	5.85
radiant floor or ceiling	6.05
Space heaters, with fan	1.60
radiant	1.80
Steam	5.05
Wall or floor furnace	1.45
Package heating and cooling	6.30
Ventilation, blower and ducts	.95
fans only	.40

3

HEIGHT REFINEMENTS

STORY HEIGHT MULTIPLIERS

Multiply base cost by following multiplier for any variation in average story height.

Average Wall Height	Square Foot Multiplier
8	.963
9	.981
10	1.000
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12	1.038
13	1.058
14	1.077
16	1.115
18	1.154
20	1.192
22	1.231
24	1.269
28	1.346

4

Average Floor Area, Sq. Ft./Story	AVERAGE PERIMETER														Average Floor Area, Sq. Ft./Story
	125	200	250	300	350	400	450	500	550	600	700	800	900	1000	
1,000	1.10	1.29	1.42	1.54	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	**1,000**
2,000	.95	1.04	1.10	1.17	1.23	1.29	1.35	-----	-----	-----	-----	-----	-----	-----	**2,000**
3,000	.90	.96	1.00	1.04	1.08	1.12	1.17	1.21	1.25	1.29	-----	-----	-----	-----	**3,000**
4,000	.87	.92	.95	.98	1.01	1.04	1.07	1.10	1.13	1.17	1.23	1.29	-----	-----	**4,000**
5,000	-----	.89	.92	.94	.97	.99	1.02	1.04	1.07	1.09	1.14	1.19	1.20	-----	**5,000**
6,000	-----	.87	.90	.92	.94	.96	.98	1.00	1.02	1.04	1.08	1.12	1.17	1.21	**6,000**
7,000	-----	.86	.88	.90	.92	.93	.95	.97	.99	1.01	1.04	1.08	1.11	1.15	**7,000**
8,000	-----	.85	.87	.88	.90	.92	.93	.95	.96	.98	1.01	1.04	1.07	1.10	**8,000**
9,000	-----	-----	.86	.87	.89	.90	.92	.93	.94	.96	.99	1.01	1.04	1.07	**9,000**
10,000	-----	-----	.85	.86	.88	.89	.90	.92	.93	.94	.97	.99	1.02	1.04	**10,000**
11,000	-----	-----	.84	.85	.87	.88	.89	.91	.92	.93	.95	.97	1.00	1.02	**11,000**
12,000	-----	-----	.84	.85	.86	.88	.89	.90	.91	.92	.94	.96	.98	1.00	**12,000**
14,000	-----	-----	.83	.84	.85	.86	.87	.88	.89	.90	.92	.93	.95	.97	**14,000**

5 **USE COUNTY MULTIPLIERS IN MULTIPLIER SECTION.**

BARNS

OCCUPANCY DESCRIPTION: Bank barns are two-story special purpose dairy barn buildings that may include livestock stalls, hay/grain storage. Common roof types are gambrel and gothic, which allow for additional loft areas. Higher-quality barns include lighting, plumbing, interior partitions, and milk processing and storage. Lower-quality barns are older milking barns only.

Barn loft costs include the floor structure and supports only; height adjustments must usually be made.

INCLUDED IN COSTS: Architects' fees and contractors' overhead and profit.

NOT INCLUDED IN COSTS: Barn loft floors, heating systems and feed, milking and cleaning equipment are not included.

BARNS – BANK (TWO-STORY) – SPECIAL PURPOSE

CLASS	TYPE	COST/ SQ. FT.	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING & PLUMBING
C	Excellent	$31.70	Decorative block, tile, arches, cupolas, gambrel roof, dormers	Plaster wainscot in cooler and washroom, good concrete and plank floors	Good lighting and plumbing, hot water, milk piping
	Good	24.10	Brick or block, good fenestration, good gambrel roof and trim	Painted concrete and plank floors, good stalls, dairy facilities, storage	Good wiring, water and power outlets, restroom
	Average	18.30	Block or structural tile, some windows, arch or gambrel roof	Concrete and wood floors, good stalls, feed room and milking	Lighting and power wiring, water service and drains
	Low cost	13.95	Brick, concrete block, structural clay tile, gable or light gambrel roof	Unfinished, some slab, wood upper floor, stalls, feed room, milking only	Adequate electrical and water outlets
D	Excellent	30.40	Best sidings or veneer, good gambrel roof, arches, cupolas, dormers	Plaster wainscot in cooler and washroom, good concrete and plank floors	Good lighting and plumbing, hot water, milk piping
	Good	22.60	Good siding or brick veneer, heavy frame and roof structure	T&G wainscot, concrete and plank floors, good stalls, dairy facilities	Good wiring, water and power outlets, restroom
	Average	16.85	Lap siding, windows, heavy frame and roof structure, gambrel roof	Some wainscot, plank and concrete floors, good stalls, feed room	Lighting and power wiring, water service and drains
	Low cost	12.60	Wood frame, board and batten or siding, few windows, gable roof	Some slab, wood upper floor, partitions, stalls, feed room, milking only	Adequate electrical and water outlets
DPOLE	Average	15.00	Pole frame, metal siding, insulated, good arch or gambrel roof	Concrete and plank floors, good stalls, feed room, interior sheathing	Lighting and power wiring, water service and drains
	Low cost	11.10	Pole frame, metal siding, few windows or shutters, good gable roof	Some slab, wood upper floor, partitions, stalls, feed room, milking only	Adequate electrical and water outlets

HAYLOFTS

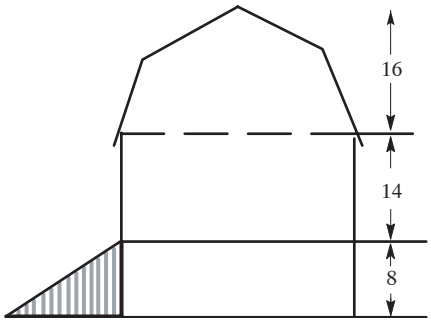
CDS	Good	$9.05	Not included	Heavy timber, good T&G or plank	Not included
	Average	5.85	Not included	Adequate support, plank floor	Not included
	Low cost	3.80	Not included	Minimum support, light floor	Not included

For wall height adjustment on buildings with high-pitched roofs, use the height from the floor to the eaves plus one-half the distance from the eaves to the ridge for the effective wall height with which to enter the story height multiplier table.

EXAMPLE:

Apply costs to total floor (both floors).

Apply loft costs to additional loft floor area.



8' + 14' + (1/2 x 16') = 30' ÷ 2 stories = 15' EFFECTIVE WALL HEIGHT

BARNS

REFINEMENTS: On this page are the means of making major adjustments to the base costs on the previous page. Follow Steps 1 through 5 to attain final costs, adjusted for lump sums, heating and cooling, story height, floor area/perimeter ratio and locality.

1 **ADJUSTMENTS**

Stalls, each, free: $55 – $120; tie: $95 – $140; box: $450 – $925; calf pen, steel: $260 – $300; wire: $25 – $50
Feed racks, per linear foot: $12.50 – $17.00; steel feeders, each: paddock, $500; bale, $450; bunk, $400
Mechanical feeder, per linear foot, trough auger: $68 – $95; chain feeder: $62 – $90; overhead: $95 – $125
Water troughs, per linear foot, steel: $16.25 – $24.75; concrete: $24.75 – $36.50; drinking bowls, each: $85 – $100
Barn cleaner, elevator and drive: $5,300 – $8,300 plus $36 per linear foot of gutter
Loft Access ramps, each: $650 – $1,075
Milking equipment: $7,250 – $12,500 base, plus $550 – $1,500 per stall, add for power gates, $750 – $900;
for feed system, add $550 – $700, plus $525 for auger, per stall;
for computerized automation, add $1,250 – $2,500 plus $30 – $45 for each I.D. tag
Bulk milk tanks, including refrigeration. For automatic wash system, add $1,850 to $2,400

Capacity, gal.	Cost	Capacity, gal.	Cost	Capacity, gal.	Cost
500	$13,000	1,500	$28,250	4,000	$56,750
750	17,250	2,000	34,750	5,000	66,250
1,000	21,250	3,000	46,250	8,000	92,500

2 **HEATING AND COOLING**

These costs are averages of total installed cost of the entire heating or cooling installation including its prorated share of contractors' overhead and profit and architects' fees.

Electric cable or baseboard	$2.90
Electric wall heaters (inc. FWA)	1.25
Forced air, ducted	3.20
heaters or furnace, vented	.95
Hot water, baseboard/convector	5.85
radiant floor or ceiling	6.05
Space heaters, with fan	1.60
radiant	1.80
Steam	5.05
Wall or floor furnace	1.45
Package heating and cooling	6.30
Ventilation, blower and ducts	.95
fans only	.40

3 **HEIGHT REFINEMENTS**

STORY HEIGHT MULTIPLIERS
Multiply base cost by following multiplier for any variation in average story height.

Average Wall Height	Square Foot Multiplier
8	.963
9	.981
10	1.000
11	1.019
12	1.038
13	1.058
14	1.077
16	1.115
18	1.154
20	1.192
22	1.231
24	1.269
28	1.346

4 **AVERAGE PERIMETER**

Average Floor Area, Sq. Ft./Story	125	200	250	300	350	400	450	500	550	600	700	800	900	1000	Average Floor Area, Sq. Ft./Story
1,000	1.10	1.29	1.42	1.54	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	**1,000**
2,000	.95	1.04	1.10	1.17	1.23	1.29	1.35	-----	-----	-----	-----	-----	-----	-----	**2,000**
3,000	.90	.96	1.00	1.04	1.08	1.12	1.17	1.21	1.25	1.29	-----	-----	-----	-----	**3,000**
4,000	.87	.92	.95	.98	1.01	1.04	1.07	1.10	1.13	1.17	1.23	1.29	-----	-----	**4,000**
5,000	-----	.89	.92	.94	.97	.99	1.02	1.04	1.07	1.09	1.14	1.19	1.20	-----	**5,000**
6,000	-----	.87	.90	.92	.94	.96	.98	1.00	1.02	1.04	1.08	1.12	1.17	1.21	**6,000**
7,000	-----	.86	.88	.90	.92	.93	.95	.97	.99	1.01	1.04	1.08	1.11	1.15	**7,000**
8,000	-----	.85	.87	.88	.90	.92	.93	.95	.96	.98	1.01	1.04	1.07	1.10	**8,000**
9,000	-----	-----	.86	.87	.89	.90	.92	.93	.94	.96	.99	1.01	1.04	1.07	**9,000**
10,000	-----	-----	.85	.86	.88	.89	.90	.92	.93	.94	.97	.99	1.02	1.04	**10,000**
11,000	-----	-----	.84	.85	.87	.88	.89	.91	.92	.93	.95	.97	1.00	1.02	**11,000**
12,000	-----	-----	.84	.85	.86	.88	.89	.90	.91	.92	.94	.96	.98	1.00	**12,000**
14,000	-----	-----	.83	.84	.85	.86	.87	.88	.89	.90	.92	.93	.95	.97	**14,000**

5 **USE COUNTY MULTIPLIERS IN MULTIPLIER SECTION.**

BARNS

OCCUPANCY DESCRIPTION: Freestall barns are typically large, open structures providing free access to stalls and feed areas and include concrete allyways and curbs in better qualities.

Commodity barns are designed with an open front and only three exterior walls with bay or partition walls. Floors are concrete. No electrical or plumbing is included. Commodity and sun shelters are open (unwalled) structures for livestock shade or for the storage of hay or other farm commodities. The floor is dirt, and there is no electrical or water. Adjust shelters for height only.

INCLUDED IN COSTS: Architects' fees and contractors' overhead and profit.

NOT INCLUDED IN COSTS: Barn loft floors, heating systems and feed and cleaning equipment are not included.

FREE-STALL BARNS

CLASS	TYPE	COST/ SQ. FT.	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING & PLUMBING
D	Excellent	$21.50	Good siding, heavy frame, ventilated walls and roof	All concrete alleys and floor, contoured, good metal freestalls	Good wiring, lights, water service, drains
	Good	15.75	Good panels, gable roof, insulated or sheathed	Half concrete and dirt, good curbs and stalls, wainscot	Good lighting and stall plumbing
	Average	11.50	Siding on wood frame, some wall curtains	Concrete alleys, curbs, dirt, metal freestalls	Adequate lights, outlets, water service
	Low cost	8.40	Wood frame, board siding	Some paved alleyways, dirt stalls	Minimum electrical and water
DPOLE	Excellent	18.75	Good siding, heavy frame, ventilated walls and roof	All concrete alleys and floor, contoured, good metal freestalls	Good wiring, lights, water service, drains
	Good	13.70	Good panels, gable roof, insulated or sheathed	Half concrete and dirt, good curbs and stalls, wainscot	Good lighting and stall plumbing
	Average	10.00	Metal siding on pole frame, some wall curtains	Concrete alleys, curbs, dirt, metal freestalls	Adequate lights, outlets, water service
	Low cost	7.30	Metal pole on frame	Some paved alleyways, dirt stalls, metal freestalls	Minimum electrical and water
	Cheap	5.20	Metal roof on poles, no walls	Paved alleys, dirt stalls	Minimum electrical and water
DHOOP ARCH	Average	8.90	Geenhouse pipe frame, wire panels, wall curtains, shaded roof	Concrete alleys, curbs, dirt, metal freestalls	Minimum electrical, adequate water
	Low cost	6.80	Wood post, knee wall, pipe hoop frame, fabric cover, side/end curtains	Concrete alleys, curbs, dirt, metal freestalls	Minimum electrical, adequate water
	Cheap	6.00	Wood post, pipe hoop, fabric cover, open side walls and ends	Minimum facility, some paved alleyways, dirt stalls, freestalls	Minimum electrical and water
S	Excellent	19.90	Good siding, heavy frame, ventilated walls and roof	All concrete alleys and floor, contoured, good metal freestalls	Good wiring, lights, water service, drains
	Good	14.90	Good panels, gable roof, insulated or sheathed	Half concrete and dirt, good curbs and stalls, wainscot	Good lighting and stall plumbing
	Average	11.15	Steel siding and frame, some wall curtains	Concrete alleys, curbs, dirt, metal freestalls	Adequate lights, outlets, water service
	Low cost	8.35	Steel siding and frame	Some paved alleyways, dirt stalls	Minimum electrical and water
	Cheap	5.45	Steel roof, frame, no walls	Paved alleys, dirt stalls	Minimum electrical and water

For slotted floors, add the following per square foot of pit area:
Shallow pit, scraper alley: $4.75 to $9.75. Deep pit, tractor access: $11.50 to $16.50.

COMMODITY BARNS (STORAGE SHEDS)

C	Average	$12.20	Open one side, cheap block, shed roof	Unfinished, no doors, slab floor, masonry bay separation walls	None
D	Average	8.60	Open one side, plywood or siding on post frame	Unfinished, no doors, slab floor, concrete & upper frame bay walls	None
DPOLE	Average	7.80	Open one side, metal on pole frame	Unfinished, no doors, slab floor, concrete & upper frame bay walls	None
S	Average	8.75	One one side, steel frame and siding	Unfinished, no doors, slab floor, concrete & upper frame bay walls	None

COMMODITY SHELTERS (HAY SHEDS)

D	Good	$3.45 – $4.31	No walls, composition or steel gable roof on wood rafters and posts, dirt floor
	Average	2.65 – 3.40	No walls, steel shed or flat roof on wood posts and girders, dirt floor
S	Good	4.54 – 5.58	No walls, steel gable roof and truss on steel column, wide span, dirt floor
	Average	3.15 – 4.08	No walls, steel shed or flat roof and girders on good steel posts, dirt floor

For concrete slab, add silage floor from adjustments table.

FARM (SUN) SHELTERS

D	Low cost	$2.05 – $2.69	No walls, light steel flat roof on light wood posts, dirt floor, sun shelters
S	Low cost	2.18 – 2.98	No walls, light steel flat roof on low-cost pipe, dirt floor, sun shelters

BARNS

REFINEMENTS: On this page are the means of making major adjustments to the base costs on the previous page. Follow Steps 1 through 5 to attain final costs, adjusted for lump sums, heating and cooling, story height, floor area/perimeter ratio and locality.

1 **ADJUSTMENTS**

Stalls, each, free: $55 – $120; stanchions, wood: $14.75 – $18.25; metal: $22.00 – $26.25; calf pen, wire: $25 – $50

Barn cleaner, each; flush tank, tip-type waterer, 70-gallon: $500 – $575; 105-gallon: $650 – $775

floor-type flooding flush system, excluding water source, cost per flush valve: $1,700 – $2,250

Fencing: 4" pipe, cable rails: $8.30 – $9.10 per linear foot;

4" pipe, 2" pipe rails: $10.60 – $11.35 per linear foot;

8' gate, each: $90 – $140 (add $30 – $45 for each addition 4')

Paved transfer lanes, 12' wide: $15.75 – $17.75 per linear foot

add for 8" curbing, double-sided: $11.50 – $13.25 per linear foot

Feeding fence, tubular steel, $5.50 – $11.00, add $10.00 – $20.00 for locking or sloped guard rail, per linear foot

Feeding troughs, one sided (fence): wood: $10.00 – $14.75; steel; $18.75 – $24.00; concrete: $25.50 – $30.25 per linear foot

Silage concrete slabs, cost: $1.40 – $1.70 per square foot

2 **HEATING AND COOLING**

These costs are averages of total installed cost of the entire heating or cooling installation including its prorated share of contractors' overhead and profit and architects' fees.

Electric cable or baseboard	$2.90
Electric wall heaters (inc. FWA)	1.25
Forced air, ducted	3.20
heaters or furnace, vented	.95
Hot water, baseboard/convector	5.85
radiant floor or ceiling	6.05
Space heaters, with fan	1.60
radiant	1.80
Steam	5.05
Wall or floor furnace	1.45
Package heating and cooling	6.30
Ventilation, blower and ducts	.95
fans only	.40

3 **HEIGHT REFINEMENTS**

STORY HEIGHT MULTIPLIERS

Multiply base cost by following multiplier for any variation in average story height.

Average Wall Height	Square Foot Multiplier
8	.963
9	.981
10	1.000
11	1.019
12	1.038
13	1.058
14	1.077
16	1.115
18	1.154
20	1.192
22	1.231
24	1.269
28	1.346
32	1.423
36	1.500

4

Average Floor Area, Sq. Ft./Story	AVERAGE PERIMETER														Average Floor Area, Sq. Ft./Story
	75	150	200	250	300	350	400	500	600	700	800	900	1000	1200	
500	1.17	1.54	1.79	2.04	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	**500**
600	1.10	1.42	1.62	1.83	2.04	-----	-----	-----	-----	-----	-----	-----	-----	-----	**600**
700	1.06	1.33	1.50	1.68	1.86	2.04	-----	-----	-----	-----	-----	-----	-----	-----	**700**
800	1.03	1.26	1.42	1.57	1.73	1.88	-----	-----	-----	-----	-----	-----	-----	-----	**800**
1,000	.98	1.17	1.29	1.42	1.54	1.66	1.79	-----	-----	-----	-----	-----	-----	-----	**1,000**
2,000	.87	.98	1.04	1.10	1.17	1.23	1.29	1.42	1.54	1.66	1.79	1.91	-----	-----	**2,000**
4,000	-----	.89	.92	.95	.98	1.01	1.04	1.10	1.17	1.23	1.29	1.35	1.42	-----	**4,000**
6,000	-----	-----	.87	.90	.92	.94	.96	1.00	1.04	1.08	1.12	1.17	1.21	1.29	**6,000**
10,000	-----	-----	-----	.85	.86	.88	.89	.92	.94	.97	.99	1.02	1.04	1.09	**10,000**
14,000	-----	-----	-----	.83	.84	.85	.86	.88	.90	.92	.93	.95	.97	1.01	**14,000**
16,000	-----	-----	-----	-----	-----	.84	.85	.87	.89	.90	.92	.93	.95	.98	**16,000**
20,000	-----	-----	-----	-----	-----	-----	.84	.85	.87	.88	.89	.91	.92	.94	**20,000**

Use total length of walled as the perimeter. Do not use table for shelters wothout walls.

5 **USE COUNTY MULTIPLIERS IN MULTIPLIER SECTION.**