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THE DAIRY PRACTICES COUNCIL®

Supplement to DPC 54

CONSTRUCTION MATERIALS FOR MILKING PARLORS

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Prepared by

FARM BUILDING & EQUIPMENT TASK FORCE
Paul Dersam, Director

Stanley Weeks, Lead Author

Contributors:
John Beers, Paul Dersam, Nancy Ferris, Robert Engle, Paul Garrett, Will Godwin, Curt Gooch, Robert Graves, Joseph Moreau, John Porter, John Tyson

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ABSTRACT

This guideline is a supplement to Guideline 54 *The Selection of Elevated Milking Parlor*. This supplement discusses the items needed to be considered prior to the construction of a milking parlor, with regard to the types of materials to be used. It covers Walls, Floors and Ceilings, Wiring, Foot Baths, Fences and Gates.

PREFACE

This was originally planned as a separate guideline to be produced under Task Force I, Farm Building & Equipment. During the writing process it was determined that it should be a supplement to Guideline 54 *The Selection of Elevated Milking Parlors*. This supplement was prepared by Stanley Weeks with input from John Beers, Paul Dersam, Dave Dunn, Nancy Ferris, Robert Engle, Paul Garrett, Will Godwin, Curt Gooch, Robert Graves, Joseph Moreau, John Porter, and John Tyson and all Task Force I members. This supplement has been peer reviewed by DPC Educational Members. It has also been reviewed by all members of Task Force I and by All Regulatory Members of DPC.

GUIDELINE PREPARATION AND REVIEW PROCESS

Guideline development within Dairy Practices Council (DPC) is unique and requires several levels of peer review. The first step in the process of guideline development starts with a Task Force subcommittee made up of individuals from industry, regulatory and education interested in and knowledgeable about the subject to be addressed. Drafts, called 'white copies', are circulated until all members are satisfied with the text. The final white copy may then be distributed to the entire task force, DPC Executive Board, state and federal regulators, education members, industry members and anyone else the DPC Executive Vice President and the Task Force Director feels would add to the strength of the review. Following final white copy review and correction the next step in the process requires a yellow cover draft that is circulated to the member Regulatory Agency representatives that are referred to as "Key Sanitarians". The Key Sanitarians may suggest changes and insert footnotes if their state standards and regulations differ from the text. After final review and editing the Guideline is distributed in the distinctive DPC green cover to people worldwide. These guidelines represent the state of the knowledge at the time they are written.

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GENERAL

Before constructing a parlor, choose a location readily accessible to the dairy barn, the milkhouse, and potential future expansions. Be sure to consider animal and operator traffic patterns, drainage inside and around the parlor[1], as well as milk and waste handling. Future herd expansion plans may require space to expand this parlor, or the addition of a second milking parlor. Rather than "save money" by using inferior construction materials, consider leaving out equipment that can be easily added in the future.
In general, water use and humidity are high in milking parlors, and all interior surfaces should be water resistant and easily cleaned. Floors should also be slip free, wear resistant and sloped to drain liquids. The longevity of a concrete floor can be extended with various surface treatments. Insulation, supplemental heat, ventilation, and moisture control are needed to protect construction materials and equipment, prevent freezing, and maintain comfortable interior conditions.

WALLS

- water resistant, cleanable, smooth, light colored
- glazed block, tile, plastic or fiberglass sheets poured concrete, concrete block (sealed)
- walls need to be insulated
- vapor barrier should be properly installed
- plastic or fiberglass interior sheets require careful sealing of all joints
- plastic or fiberglass sheets should be installed to allow for expansion and contraction
- wood frame walls need protection from moisture
- interior wall material and sealant must withstand high pressure washing

CEILINGS

- water resistant, corrosion resistant, non-combustible, light reflective, smooth, easily cleaned, light colored
- aluminum, plastic or fiberglass sheets
- insulate appropriate to climate to prevent condensation, heat gain and heat loss
- proper attic ventilation to remove moisture is important
- vapor barrier should be installed below insulation

[1] California Department of Food & Agriculture:
requires a 15" elevation above ground level for parlor & milkhouse to provide proper drainage

FLOORS[2]

- slip resistant, wear resistant, sloped for drainage and cow traffic
- grooves in holding area, broom finish or textured aggregate for cow platform
- floor slopes for drainage need to be a minimum of ¼" per foot
- entrance and exit alleys should be curbed on outside edges to contain manure and for effective cleaning
- gutters and grates are optional, they do reduce manure and urine splash
- grate bars need to be approximately 5/8" square (cows avoid narrow grates)
- operator work area should slope from the center towards the cow platform
- consider rubber mats in the holding area and on cow platform for cow comfort
- choose mats that can be easily removed periodically for cleaning
- concrete (3,500 psi minimum)

WINDOWS

- minimize number to reduce heat loss, cost, and deterioration
- use insulated glass to minimize condensation in cold weather
- fiberglass, vinyl, or painted metal finishes resist deterioration and mold growth
- slope interior window sill to allow for drainage of any condensation
- windows should be flush with interior wall surface
- protect from damage and cow movement
- consider windows at the front and sides of the parlor that can be opened for ventilation
- consider skylight windows for some barn designs

[2] California Department of Food & Agriculture:
requires all floor and wall junctions be provided with a 2" radius cove

DOORS

- personnel doors should resist water, high humidity, slams and kicks
- aluminum skinned doors in a heavy duty aluminum jam are superior to wood doors
- cow entrance and exit doors should be metal skinned, heavy framed doors
- fiberglass doors are another corrosion resistant option
- eliminate cow entrance and exit doors whenever possible
- consider plastic strip doors or drop curtains to separate the holding area from the barn
- handles and hardware need to be corrosion resistant and industrial type
- overhead door track and hardware should be corrosion resistant
- when doors are required to be self closing, high quality closure devices should be used and exit doors should open outwards

CURTAINS

- sidewall curtains may be used for natural ventilation
- consider insulated curtains in cold climates to reduce heat loss and reduce condensation
- cows must not come in contact with curtains
- bottom of curtains should be 3 feet from the floor to protect from manure and water
- controls need to be readily available to milkers
- curtains in the parlor need to be kept clean just like the rest of the interior surfaces

PIPES

- all pipes should resist corrosion from water, high humidity, and manure
- good practice to label water pipes to show flow
- use galvanized, PVC, plastic, copper, stainless steel
- insulate cold water lines to avoid condensation
- paint all on-site welds of galvanized pipe

WIRING

- install according to the National Electric Code, and any local codes
- circuit breaker panels should be installed in dry locations outside the parlor
- duplex outlets should be protected with ground fault interrupters
- install switches at least five feet high to protect from moisture and animals
- each piece of equipment should have overload or fuse protection
- the Agricultural Wiring Handbook is an excellent reference
- surface mounting is the preferred method in order to assure moisture control

LIGHTING

- good lighting is necessary and required to properly clean, examine and treat the cow's udder
- direct lighting to minimize operator shadows
- recommended light level at the cow's udder is 50 foot candles
- light colors on walls and ceilings improve lighting levels
- fixtures must be moisture resistant
- choices are fluorescent and metal halide

GROUNDING AND BONDING

- proper grounding is required to protect people, animals, and property
- use grounding methods conforming to the National Electric Code
- all metal pipes, stalls, and equipment need to be bonded to the grounding conductor
- see DPC-42 for information regarding stray voltage protection
- equipotential plane floor grids need to be installed

FAN VENTILATION

- ventilation is needed to provide fresh air, remove odors, and remove moisture
- system may be positive pressure, negative pressure, or neutral pressure
- air inlets and outlets need to be properly sized and located

- air intakes should bring in clean and dry air
- exhaust air should go directly outside, as it is laden with moisture
- variable speed fans are needed for good control throughout the year
- use corrosion resistant fans and housings**,** with controls for wet locations

NATURAL VENTILATION

- may be provided with a combination of wall and ceiling openings
- may be assisted with fans at times of the year
- depends considerably on parlor orientation and prevailing winds

VAPOR BARRIERS

- are needed at floors, walls and ceilings to prevent moisture movement
- poly barriers keep moisture from wall cavities and the attic
- barriers must be continuous, or overlap at all seams (tape to seal around pipes)
- wall mount all conduit and electrical boxes

ATTIC VENTILATION

- needed to remove moisture, and remove heat in hot weather
- may be fan powered, or natural
- consider combinations of soffit, ridge, and gable end vents
- exhaust fans should be used only if natural ventilation is inadequate

INSULATION

- needed in walls and ceilings to reduce heat loss and gain, and prevent condensation
- needs protection from damage, moisture, and resultant decay
- R-value will depend on local climate
- use insulation that will not absorb moisture and will resist rodents

HEATING

- needed in cold regions to prevent freezing and provide operator comfort

- radiant and low level convective heating are two methods to consider
- radiant ceiling or floor systems are energy efficient
- may consider benefits of solar panels
- utility room heat, supplemented by a furnace, is effective
- fan forced unit heaters are less effective, and difficult to clean

STEPS

- may be concrete or corrosion-resistant materials
- removable stairs/or steps should be of proper design and easy to maintain
- step surface must be slip resistant
- the rise and run of steps must remain constant for a given set of steps
- step handrails should be considered if there are more than four steps
- suggested run is 12", rise is 7"

RAMPS

- may be used between operator area and cow platform
- ramp steepness may be a problem when descending
- ramp angle from the horizontal should not exceed 28 inches in 10 feet
- surface must be non-skid

MATS

- consider mats for improved operator comfort
- allow for one inch of mat thickness when planning for cow platform height
- choose mats that can be easily removed periodically for cleaning
- mats should have feet that will allow underneath drainage

FOOT BATHS

- locate in exit lanes from parlor
- may be concrete formed in the floor, or fiberglass, plastic, stainless

- need a design that allows for easy, complete, draining and cleaning
- need a close-by source of water
- consider an un-treated water bath prior to the treated bath
- bath should be approximately 4” deep

FENCES AND GATES

- are extremely important for cow and people traffic
- should be galvanized heavy-walled steel for long life
- consider vertical acting gates where space or cow movement is an issue
- pass-through openings for people need to be carefully considered
- make sure a down cow can be easily moved from the area
- gate latches should be able to be operated with one hand
- consider adjustable length gates for special situations
- air-operated cylinders are recommended if gates are mechanized
- consider rust shields where pipes enter the concrete floor
- gates and fences should be installed to provide effective and ease of cleaning