



Milk and Dairy Food Safety Branch
1220 N Street, Sacramento, CA 95814

GUIDELINES FOR THE SANITARY CONSTRUCTION OF MARKET MILK DAIRY FARMS

(rev. 10-20-2011)

The following outline lists sanitary requirements and standards of construction applicable to market milk dairy buildings. It is intended only as a guideline to assist with understanding the need for sanitary design when construction of a market milk dairy farm is being considered. For comprehensive information on requirements, those specified by Food and Agricultural Code Sections 33451-33552, and by Title 3, Division 2, Chapter 1, Article 22 of the California Code of Regulations (CCR) titled "Permanent Market Milk Dairy Buildings" should be referred to. Plans and specifications for market milk dairy buildings are required to be submitted to CDFA for approval prior to construction, including elevations and sufficient detail to ensure compliance with provisions of the California Code of Regulations.

1. LOCATION/SITE

- a. The milk house and milking barn must be located in a place free from contaminating surroundings.
- b. Feed racks, calf, bull, hog and poultry pens, horse stables, horse corrals, and shelter sheds cannot be located closer than 100 feet from the milk room or 50 feet from the milking barn.

2. SURROUNDINGS, CORRALS AND RAMPS

- a. Dirt or unpaved corrals or lanes cannot be located closer than 50 feet from the milk house or 25 feet from the milking barn
- b. Corral drainage must be provided
- c. Corrals must slope
 - i. 3% for 400 square feet or less per cow of corral space
 - ii. May reduce to 1.5% if 800 square feet or more per cow
- d. Ramps must be paved (concrete or equivalent), curbed (minimum 6 inches wide and 6 inches high) and sloped to drain.
- e. Cow wash area
 - i. Must be paved (concrete or equivalent) with 2-inch radius coving and sloped to a drain. The perimeter of the area must be constructed in a manner that will retain the wash water to a paved drain area.
 - ii. A hose bib should be available
 - iii. Gates covered
 - iv. Walls smooth plaster or metal covered, and high enough to afford protection
- f. Feed racks and mangers
 - i. Paved access for dairy livestock
 - ii. Paved 10 feet back from the stanchion line (concrete or equivalent)

- g. Water troughs
 - i. Paved access
 - ii. Paved 10 feet wide at drinking area
 - iii. Must have a drain to carry water away from corrals
 - iv. The water inlet must be air-gapped or protected from backflow
- h. Elevations
 - i. Floor level must be at least 15 inches above surrounding ground level
 - ii. Drainage must be carried at least 50 feet from milk barn and 100 feet from milk house
 - iii. Automatic pumps may be used

3. MILK HOUSE

- a. General Provisions
 - i. A suitable milkhous or room, which is properly screened to exclude flies or insects must be provided
 - ii. The milk house must be located under the same roof (extended) as the milking barn
 - iii. Hot and cold running water must be installed in each room
- b. A suitable milk house or room, which is properly screened to exclude flies or insects must be provided
- c. The milk house must be located under the same roof (extended) as the milking barn
- d. A minimum distance of 5 feet is required between farm milk tank and wash trays
- e. A minimum distance of 2 feet is required between farm milk tank or appurtenance and any wall or ceiling
- f. The distance from tank to wall may be reduced to 6 inches when the farm tank is bulk-headed no more than 36 inches into the milk room.
- g. A hand-wash basin with soap and single service towels must be provided
- h. Hose port to exterior is to be provided with closures
- i. A one room milk house must have:
 - i. A tank for milk storage
 - ii. A pipeline to convey milk from the milking barn to the tank
- j. A passageway (breezeway) between the milking barn and milk house is permitted if:
 - i. At least 3 ft. clearance for ingress and egress is provided
 - ii. Ceiling ventilation is provided
 - iii. Equipment that is part of the milk-line system may be stored in passageway
 - 1. 3 ft. clearance is maintained
 - 2. Sufficient space is provided between equipment and walls to permit disassembly for cleaning or inspection
 - 3. Walls must be finished the same as the milk room
 - iv. May be closed at one end
 - v. Barn may be separated by pipe rail fence
 - vi. Barn floors sloping toward passageway must be separated by 12 inch minimum concrete wall
 - vii. Concrete floor slabs must be reinforced with #6 x #6/10 x 10 steel mesh or equivalent provided:
 - 1. 3 ft. clearance is maintained
 - 2. Walls are finished the same as the milk room

k. Walls and Ceilings

- i. All walls and partitions concrete or masonry 8 inches above floor
- ii. Milk room and washroom walls, partitions and ceilings have a smooth finish
- iii. Sheeting may be used above 8 inches provided:
 - 1. It is corrosion and rust resistant
 - 2. Has firm backing and sealed joints
 - 3. Voids below the floor line are filled with concrete
 - 4. It has a smooth cleanable finish
- iv. Ceiling height at least 9 feet above floor
 - 1. Must be height of farm tank plus 2 feet
 - 2. May follow rafter to plant line which is 7 feet 3 inches above floor
 - 3. Cupola or light well provide at least 2 feet of clearance for equipment extending into the area

l. Doors and windows

- i. Must have minimum one window (glass or equivalent)
- ii. Window area to be equivalent to 1/10 of floor area
- iii. Windows that open must be screened with 16 mesh screen
- iv. Only stationary windows to be installed on barn side of milk house
- v. Exterior doors
 - 1. Open outward
 - 2. Solid
 - 3. Self closing
 - 4. Tight fitting
- vi. On load-out side, a sliding glass door may be used if it meets above requirements
- vii. Where milk room and wash room are separate, a swing door or self-closing door to wash room shall be used
- viii. Doors to passageway
 - 1. Solid type
 - 2. Waterproof sheathing covered bottom half on both sides
 - 3. Located to lead into wash area
 - 4. Must open outward and be self-closing
- ix. Wooden door jams must terminate 6 inches above the floor
- x. The concrete cove must extend to jams or frames
- xi. Artificial light must be installed in each room to provide at least 30 foot candles at floor level and must not be located over bulk tank openings or wash ways.

m. Ventilation

- i. Wall ventilators
 - 1. Must be installed horizontally, 4 to 10 inches above floor
 - 2. One in each room if two room milk house
 - 3. Must provide equivalent opening of 2% of floor area
 - 4. Metal framed insect screens and closable louvers must be installed in wall vent openings
 - 5. Wall vents may not be installed on milking barn side of milk room
- ii. Ceiling Ventilators
 - 1. Required in milk room
 - 2. Must not be located above bulk tank openings or wash trays
 - 3. Forced draft ventilation is permitted

4. Ceiling vent must be shafted to roof peak vent
 - a. 12 inches in diameter
 - b. Height to properly ventilate
 - c. Must exclude dust, rain, birds, insects and trash
 - d. Must provide opening of 2% of floor area
 - e. Oil and gas water heaters must be vented to outside above roof edge
- n. Drainage
 - i. May be connected to barn drainage but must be designed to prevent backflow
 - ii. Floor drains
 1. Must be vented
 2. Must be water trapped
 3. Must have a clean out plug
 4. Drains and pipes under the floors must have leak-proof connections
- o. Painting
 - i. All inside woodwork must be painted
 - ii. Must be a light colored waterproof paint
- p. Tanker loading
 - i. Tanker loading area next to milk house must be paved and at least 10 feet x 12 feet in dimension
 - ii. If tanker is used in lieu of a farm tank, overhead protection must be provided over the loading/washing area.

4. MILKING BARN

- a. General provisions
 - i. Sound and readily cleanable
 - ii. Must afford sufficient work space
 - iii. Must admit sufficient light and ventilation
- b. Slopes and finishes
 - i. Floors, curbs or gutters of concrete or other acceptable material
 - ii. Floors or gutters at least 4 inches thick
 - iii. Floors, alley, gutters, mangers and curbs shall slope lengthwise 1-1/2 inches in 10 feet
 - iv. Cow standing platform in flat barn and litter alley shall slope at least 1 inch toward the gutter
 - v. Cow standing platform in elevated barn shall slope 1-1/2 inches in 10 feet toward the wall gutter (may be eliminated with approved flush system)
 - vi. 2 inch radius cove at floor and wall joints
 - vii. Cove must be an integral part of the floor
 - viii. Finish
 1. Manger and curbs must be smoothed with steel trowel
 2. Cow standing platform, litter alley, feed alley and gutter must have a true even surface from wood float
 3. Cow standing platform, litter alley, holding corral and concrete lane must be treated to prevent slipping
 - a. Finished with suitable instrument drawn in direction of both slopes
 - b. Treat with emery aggregate, carborundum grit or equivalent
 - ix. Rock or sand cushion of 6 inches must be placed under floor
 - x. Concrete must be reinforced with #6 x 6/10 x 10 steel mesh

- c. Walls
 - i. Masonry or reinforced concrete at least 3 feet 6 inches above floor
 - ii. Finished smooth on inside with top ledge rounded on open walls
 - iii. When a barn wall forms part of the holding corral or an entrance or exit lane, it shall be finished smooth on the outside.
 - iv. Where concrete block or masonry construction is used, all voids below the floor line shall be filled with concrete.
 - v. In elevated stall type barns, the wall under the cow standing platform adjacent to the milker's area shall be finished smooth.
- d. Plate-line
 - i. For a floor level barn it must be at least 7 feet 3 inches above the floor
 - ii. For elevated barns, minimum 6 feet 6 inches above cow standing platform
- e. Superstructure
 - i. Smooth material
 - ii. Roof sheathing must be applied directly to rafters
- f. Electrical wiring
 - i. Must be surface mounted in rigid conduit or electrical metal tubing
 - ii. Waterproof switches, outlets, couplings and fittings in wet locations.
 - iii. Metal stanchions must be electrically grounded
- g. Stalls
 - i. Floor level barn
 - 1. Not less than 3 feet wide for each cow
 - 2. Must be at least 4 feet 10 inches and not over 6 feet from stanchion line to gutter
 - 3. Where stanchion is not used, the cow standing platform must be at least 7 feet in length
 - ii. Elevated stall
 - 1. The cow stall in tandem type elevated stall barns shall be 8 feet in length (manger to gutter).
 - 2. Must have a smooth, flat, non-absorbent splash panel behind each cow in tandem, parallel and herring bone stalls
- h. Light and air space
 - i. Minimum of 400 cubic feet of air space for each stall
 - ii. Window space equivalent to 6% of floor area
 - iii. Light transmitting material in roof may be substituted for window space
 - iv. Artificial light not less than 20 ft. candles at floor level and located to minimize shadows.
- i. Alleys
 - i. Flat Barn
 - 1. Litter alley exclusive of gutter to be 4 feet 9 inches behind single string of cows or goats
 - 2. Two string head out barns shall have 8 feet between gutters
 - 3. In floor level barns the feed alley two string head out and single string shall be 5 feet 9 inches wide between stanchion line and wall
 - 4. Two string head in barns, 10 feet between stanchion lines
 - ii. Elevated barn
 - 1. Two string tandem milkers alley 8 feet wide but may narrow to 5 feet if automatic feeders are used
 - 2. Width of milkers alley in herringbone barn may narrow to 5 feet
 - 3. Single string milkers alley may be 4 feet wide; if combined with passageway must be 8 feet

j. Gutters

i. Flat barn

1. May be trench or step off type located to catch defecation
2. At least 14 inches wide and 2 inches deep at cow standing platform
3. Gutter must slope down and away from cow standing platform $\frac{1}{2}$ inch across its width
4. Gutter must have uniform depth for its entire length

ii. Elevated barn

1. Stall gutter

- a. Located to catch defecation
- b. 500 square inches in area, 20 inches wide, 4 inches deep
- c. Herringbone may reduce to 14 inches wide provided 500 square inches in area is maintained
- d. Grate covered
- e. Parallel type barns to have a 6 inch wide gutter mounted to the splash panel and with automatic flush when cow exits

2. Wall gutter

- a. 8 inches wide and 3 inches deep
- b. Bottom may be rounded
- c. Trench gutters may be eliminated in exit alley that are below standing platform elevation and sloped to a drain

3. Drainage pipe used must be a minimum of 4 inches

k. Curbs

i. Flat barn

1. Curb under stanchion line at least 12 inches high and six inches wide with a rounded top
2. Curb may be eliminated if metal mangers are used

ii. Elevated barn

1. Curbed next to milker's alley at least 4 inches high and rounded
2. Metal curbs shall be free of voids and sealed to stall floor or wall

l. Stanchions

- i. Made of metal or other waterproof, easily cleanable material
- ii. Lower horizontal line of stanchion must be at least 2 inches above curb
- iii. Stanchion to be at least 14 inches above floor if no curb is used

m. Mangers

i. Flat barns

1. Minimum width of 27 inches with a back wall at least 12 inches above the floor
2. All corners must be rounded
3. Low point of manger must be at least 8 inches out from stanchion line and 3 inches above the floor
4. Lengthwise slope must be a minimum of 1-1/2 inches in 10 feet
5. Must use impervious materials, finished smooth
6. Must provide drain at low points

n. Ventilation for barn and holding corral/wash area if roofed

- i. Continuous open 18 inch ridge vents that rise 6 inches above roof
- ii. If ridge vent continues over feed room, it must be screened
- iii. Stack vents
 1. 12 inch diameter opening on single string barns
 2. 14 inch diameter opening on multi-string barns
 3. Not more than 10 feet between vent and wall or vent and vent

- iv. Flat ceiling barn
 - 1. Must have two vents 2 ft. X 2 ft. shafted to roof peak with no less than a 12 inch opening.
 - 2. May be located over milker's pit or cow standing platform
 - 3. Vents not located more than 10 feet from wall and other vents
 - o. Barn doors- Lower half must be covered on both sides with smooth corrosion resistant metal
- [NOTE: The dimensions of sub items (c), (g), (i), (j), (k), (l) and (m) of this section may be altered for milking barns for goats.]

5. PAINTING

- a. All woodwork must be painted with light colored waterproof paint or material

6. ROOF DRAINAGE

- a. Roof drainage from barns, milk house or shelters must not drain into corrals unless paved and drained

7. FOOD AND FEED STORAGE FACILITIES

- a. Stored in barn
 - i. Partitioned from barn and fly and rodent proof
 - ii. Feed discharge area must be paved, curbed and drained
 - iii. Bulk feed may be discharged directly into barn
 - iv. Bulk feed tank must be at least 6 feet from milk house
 - v. Overhead storage must be fly, rodent and dust free
 - vi. Conveyors must be a tightly closed and dust free system
 - vii. Dust tight overhead metal feed tanks may be used
 - viii. Barn ceiling to be smooth and readily cleanable if overhead storage used
- b. Stored outside
 - i. Must be 50 feet from barn and 100 feet from milk house
 - ii. Recommend storage sheds be located to rear of corrals and not by market milk buildings

8. TOILET AND HAND WASH BASIN

- a. Toilet
 - i. Must be installed in milk house, milking barn or adjacent to milking facility
 - ii. May not open directly into milk handling area
 - iii. Must have fly proof-screened windows and self-closing door
 - iv. Must be well lighted and ventilated (recommend high and low vents)
 - v. Must be equipped with flush type toilet
 - vi. Must have stationary hand-wash basin with soap and single service towels
- b. Hand wash basin
 - i. Must provide water tap with a basin
 - ii. Must provide soap and single service towels
 - iii. Must be installed in milk house and passageway, or barn, in a location convenient to milkers and milk handlers

9. SUPPLY STORAGE

- a. Supplies in milk house must be stored so they are at least 4 inches off of the floor
- b. Only supplies that come in contact with milk or milk contact surfaces may be stored in the milk house.
- c. Supplies must be protected from contamination.

10. WATER SUPPLY

- a. Well must be located at least 50 feet away from animal enclosures; 100 feet from septic tanks or leach lines; and 150 feet from any seepage pits more than 8 feet deep
- b. Wells must be constructed in accordance with state and local requirements
- c. Water supply must be tested initially, when repaired, and at least every 3 years
- d. Air gap protection to unsafe water supplies shall be twice (2X) the diameter of the supply pipe above the unsafe water to highest point of overflow and the overflow must be twice (2X) the diameter of the water inlet.
- e. Well water effluent from the plate cooler cannot be commingled with equipment water.
- f. An approved backflow prevention device is required to ensure protection upstream to the plate cooler if lines are commingled to the cow wash tank.

11. MILKING EQUIPMENT

- a. Air separator to the milk receiver is required to extend no more than 6 inches above the top of the receiver
- b. Vacuum line from the air separator must have ½ inch downward slope in the first foot of pipe.
- c. No exposed threads on milking equipment
- d. Milk pumps must be at least 4 inches off the floor. Portable pumps at least 2 inches off the floor
- e. Air blow applications must meet culinary air requirements. Air cooler and dryer prior to the storage tank.
- f. Air gap protection must be provided to the milk CIP receiver from all water and CIP lines during the milking process

12. MILK STORAGE TANKS

- a. A plan or diagram with dimensions for each installation must be submitted to the inspection service or inspector in advance and be approved before the installation is made.
- b. Tanks must have minimum of 2 feet of clearance on all sides from any equipment, wall or ceiling.
- c. Six inches clearance from wall is allowed if bulk headed tank protrudes no more than 36 inches into milk room
- d. A milk transfer pump located in the milk house requires at least 3 feet between tank and building wall at tank outlet end.
- e. At least six inches of clearance must be provided between the bottom of the tank, or pipe under the tank, and the floor.
- f. The minimum distance between a farm tank and wash trays is 5 feet
- g. The farm tank must not be located over a floor drain.
- h. Farm tanks must be provided with accurate thermometers and an approved temperature recording device
- i. Sanitary caps must be used for tank outlets
- j. A farm tank agitator opening located outside the milk house must be tightly sealed.
- k. Transfer of milk from the farm tank to a bulk milk tanker truck must be made only through conductor pipe openings in the milk house or stationary door. Such openings must be provided with closures.
- l. Sanitary milk pumps must be protected at all times from contamination

- m. Farm tanks must be constructed of acceptable materials and in such a manner that they may be properly cleaned, sanitized and drained. The measuring device must be made of stainless steel or other acceptable material.
- n. All valves and fittings on farm tanks must be easily disassembled for cleaning
- o. Sufficient light and ceiling vents, located away from tank openings or wash trays
- p. Boilers or heaters that emit smoke, soot, oil or odors must not be installed in the milk house or room.