



Cabinet for Health and Family Services

DEPARTMENT FOR PUBLIC HEALTH,
PUBLIC HEALTH PROTECTION & SAFETY
MILK SAFETY BRANCH
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2005 RECOMMENDATIONS AND SPECIFICATIONS FOR CONSTRUCTION OF GRADE A DAIRIES, MILKING SYSTEM INSTALLATIONS, BULK MILK STORAGE, AND IMPROVED MILK QUALITY

THESE RECOMMENDATIONS AND SPECIFICATIONS FOR CONSTRUCTION OF GRADE A DAIRIES ARE REQUIRED BY STATE REGULATION UNLESS FOLLOWED BY A STATEMENT IN PARENTHESIS (RECOMMENDATION ONLY).

These recommendations are provided for producers, fieldmen, co-ops, inspectors, builders, equipment dealers, and other individuals or concerns interested in the planning and construction of milking facilities for the production of Grade A Milk in the Commonwealth of Kentucky.

It is not the intent to list each requirement or recommendation nor spell out in detail each requirement for Grade A facilities of the Commonwealth of Kentucky and the United States Food and Drug Administration, but rather serve as a guide in planning the basic facilities for a Grade A dairy.



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Plans:

New dairy farm installations should be approved by the Local Health Department and Soil Conservation service for waste disposal before beginning construction of a milking parlor.

Properly prepared plans shall be submitted to the KY Milk Safety Branch, Health Services Building, HS1CB, 275 East Main Street, Frankfort, Kentucky 40621, for approval before construction work is begun. A plan to install or alter a pipeline or bulk tank shall be submitted before installation.

Animal Health:

Cows from Kentucky herds need not have T.B. papers. Cows from out-of-state herds must have T.B. papers or be from an accredited T.B. free state.

Private Water Supply:

1. Supply is not to be located closer than 50 feet to a privy, septic tank, manure pack, or cow yard and not closer than 100 feet to a sewage pit or drain field (unless geological and sanitary survey showed otherwise.)
2. Well: Casing shall extend 6" above concrete slab, a sanitary tight seal and screen vent, with concrete slab around the casing extending a minimum of 2' in all directions. Pit less adapters and submerged pumps do not require a concrete slab.



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3. Cisterns: Cisterns shall be constructed of watertight material with manhole openings tightly sealed with a shoebox type lid or other approved method. A sand, gravel type filter or roof washer shall be installed on all cisterns. A chlorinator or other equivalent disinfection means shall be required on all new cisterns. Roof run-off area is to be of good construction. Plans for filters or roof washer can be obtained from your milk inspector.
4. Springs: Protective run-off, tight construction around entrance of water. Pump should not be installed over water. Overflow pipe shall be screened. Chlorinator or other equivalent disinfection means. Fence and a surface drainage ditch shall be located uphill from the source so as to be inaccessible for cattle and surface run-off.
5. Farm Pond: Slow sand filter or equivalent and chlorinator or other equivalent disinfection means. Fenced and run-off area seeded in grass.
6. Hauled Water: Sampled monthly.
7. A negative sample must be on file initially and at least every 3 years.
8. To protect the water supply, there should be no cross connection to a non-potable water supply.
9. Municipal water will be used if available.



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Toilet Facility:

1. Conveniently located flush-type toilet, or outside pit privy near milk house or barn, other than in owner's home for hired help and tenants.
2. Septic tank and disposal field for human waste to be approved by the Local health Department.

Milk Room:

1. Minimum size large enough to allow for 30 inches in all working aisles and a minimum of 18 inches in other areas. (Actual size will depend largely on bulk tank dimensions)
2. Floor to be graded to drain ($\frac{1}{4}$ " per foot recommended).
3. Floor drained to one or more cast iron or approved plastic drains. Vented if connected to sewer or drain field.
4. Floor drains for milk room and parlor may connect outside of building (recommend clean out). (Recommendation only).
5. Walls to be finished in a smooth easily cleanable surface material.
6. Artificial lights equivalent to 20-foot candles on working surfaces. A light will be at, but not directly over the wash vat. A light will be at, but not directly over the bulk tank opening. See bulk tank installation.



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7. Milk room to be fly tight (with doors self-closing open outward and windows screened, if to be opened). Solid self-closing door between milk room and milking barn.
8. Hot water heater capacity adequate for operation, depending on CIP equipment and/or number of cows milked. (Recommended 80 gallon @ 165 F as minimum size with CIP cleaning).
9. Windowsills sloped. (Recommendation only)
10. Two compartment stainless steel wash vat (mixing valve for hot and cold water). When milking or washing equipment is permanently installed in one wash vat compartment, two additional wash vat compartments are required.
11. Lavatory with hot and cold water, in milk room and convenient to milking operation.
12. Ceiling height not less than 8 feet. (Recommendation only)
13. Milk room painted a light color or prefinished light colored material.
14. 4'x6' concrete slab under hose port and in front of milk house door. (Size recommendation only)
15. Mechanical ventilation may be required in lieu of windows.



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16. A 220-volt grounded weatherproof electrical outlet to the milk pump on the tank truck should be located on the outside of the milk house close to the hose port. See your milk hauler for the exact style of male plug used on his truck. A switch to control the power to this outlet should be inside the milk house near the outlet of the bulk tank.
(Recommendation only)

Bulk Tank Installation:

1. More than 30" from outlet valve of milk tank to wall or hose port.
2. At least 30" between tank and other milk room equipment.
3. 18" between tank and vacant walls. (Also back side of tank unless properly bulkheaded)
4. Not directly over a floor drain.
5. Lighting, vents or other lines not located over tank openings.
6. Valve 6" above floor and not closer than 12" to any floor drain.
(Recommendation only)
7. A convenient means for access to the tank interior shall be provided.
8. The measuring stick must be removable from the bulk tank.



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9. Bulkhead tanks must be of approved design for through the wall installation. The only permitted bulk tank openings outside the milk room wall shall be properly protected agitator openings.
10. Bulk milk tanks manufactured after January 1, 2000, shall be equipped with a recording thermometer. Producer shall maintain recording chart records for a period of six months.
11. Dairy farms using transport tank trucks for storage of milk shall provide:
 - A “full tank” alarm
 - Inline temperature recorder
 - Maintain recording chart records for 90 days
 - Parked on self-drained concrete slab.
 - Tank valve to be protected from outside environment at all times.
 - See item 5r in the Pasteurized Milk Ordinance (PMO)

Milk Parlor:

1. Height of ceiling 8 feet and above ramp 7 feet. (Recommendation only)
2. Floor drains to be 4” minimum. (Recommendation only)
3. Waste to be piped not less than 10 feet from barn. (A clean out outside of parlor is recommended)



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4. A minimum of 10-foot candles of light in all working areas shall be provided. (One 100 watt bulb, or its fluorescent equivalent, per 10 linear feet)
5. Holding pens for cows – (14 square feet per cow is recommended) (Recommendation only}
6. Walls and ceilings to be finished with a smooth type material.
7. Painted a light color or prefinished material or a light color.
8. Stanchion is to be built of smooth substantial material and feed troughs built of concrete or equally impervious material.
9. Mechanical ventilation may be required in lieu of windows.
10. An unapproved water supply can be installed with proper, permanent identification in the milking area for the purpose of cleaning floors or walls or watering animals. No cross connections are allowed to an approved water supply.
11. The following facilities should be grounded back to the main electrical source (feeder, hot water heater, milk pump, bulk tank, and electric doors). (Recommendation only)
12. Surroundings shall be maintained in a neat and clean condition, free of harborages and breeding areas, within a minimum distance of 50 feet of the milking facility.



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13. There will be no livestock traffic or livestock waste in front of the tank room.
14. Truck loading areas shall be constructed of a minimum solid gravel surface and maintained to prevent the accumulation of mud and animal waste.



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RECOMMENDATIONS RELATING TO SPECIFICATIONS FOR MILKING SYSTEM INSTALLATIONS AND BULK MILK STORAGE

All equipment shall meet the 3-A Standards.

1. Milk pipeline to be self-draining.
2. Milk inlets in upper half of milk line but not straight up.
3. Milk piping must be approved material.
4. The vacuum line between vacuum bulk tank and moisture trap is sloped toward trap. (Plastic lines and/or stainless steel and rubber elbows are permitted, not to rise more than 1 foot and slope toward a trap) with top of trap below top of bulk tank.
5. Milk line sizing guide: (Recommendation only)
 - 1) 1 – 2 units per slope: 1.5”
 - 2) 3 – 4 units per slope: 2”
 - 3) 5 – 9 units per slope 3”
6. On single line pipelines the distal receptacle shall be located under the parlor ceiling in such a way to be accessible for inspection.



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7. Milk lift from claw to pipeline not to exceed 4 feet. However, a shorter distance is recommended. (Recommendation only)
8. The minimum size for main vacuum supply pipelines of pipeline of milking systems, and the vacuum lines size between the milk receiver and vacuum supplier (pump) should be based on the following: (Recommendation only)

<u>Number of Units</u>	<u>Pipe Size (I.D.)</u>
1-10	2"
11-13	2½"
14 or more	3"

9. Vacuum regulators and pumps shall not be located in a feed room or attic. They should be in a dust free area. (Recommendation only)
10. A vacuum gauge should be installed in a system. (Recommendation only)
11. A vacuum regulator shall be installed according to the manufacturer's specific recommendations. In lieu of manufacturer's specifications the vacuum regulator should be installed on the pump distribution tank opposite pulsator line opening or next to the milking vacuum opening.



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12. A self-draining vacuum reserve tank should be provided and should be located close to the vacuum pump. The inlet and outlet connections should be at least as large as the vacuum line. (Recommendation only)
13. Vacuum lines and traps shall stay clean at all times.
14. A qualified technician should service vacuum system at a minimum of every six months. (Recommendation only)
15. There should not be any milk filters between the milker claw and receiver and/or weigh jar if system is so equipped. (Recommendation only)
16. A loop vacuum line (pulsation) is recommended. (Recommendation only)
17. The vacuum reserve should be equal to 50% of the total required vacuum to effectively operate the system. (Recommendation only)
18. The lowest points of vacuum lines and vacuum traps shall be self-draining.
19. Minimum Vacuum Recommendations for Pipeline Milkers: (Recommendation only)



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<u>Component</u>	<u>CFM Requirements (ASME) Standard</u>	<u>New Zealand Standard</u>
Milker Unit	6.0	12.0
Releaser	5.0	10.0
Pulsator Line (Per 10' of length)	1.0	2.0
Milk Meter	1.0	2.0
Couplings, per 20	1.0	2.0
Inlets, per 10	1.0	2.0
Reserve for Regulator	3.0	6.0

The 50% reserved capacity recommended is included in the table above.

It is recommended that there be a vacuum system for the pipeline milking system, to operate only the components of the system. If there are vacuum operated accessories such as doors, gates, etc., there should be a separate vacuum system to operate them.

20. Milking pipelines shall be self-draining except for normal clingage or condensate, and shall have a continuous slope from a high point.
21. Openings in walls, solid partitions, etc., through which milking pipeline and/or milk conveying line pass shall have sleeves in the openings.



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22. The milk pump shall be activated by a level sensing device and if of probe type, the probes shall be readily demountable for inspection and shall be located so that all of the product contact surfaces are reached by the rinse and wash solutions.
23. The milk pump and interconnecting piping shall be installed so that they are self-draining and pitched to drain points.
24. CIP pipeline inlets and lines should be sloped and/or designed so as to be CIP cleanable. (Recommendation only)
25. Air injectors should be installed on all pipeline systems. (Recommendation only)
26. Encourage the use of a recording thermometer on all bulk milk tanks as a constant monitor of tank temperature. (Recommendation only)
27. If a producer is having a mastitis problem, we recommend that the producer have his milk parlor checked by the electric co-op for stray voltage. (Recommendation only)
28. Yearly check of voltage on liquid level probes. (Recommendation only)



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29. Flexible milk tank swing lines allowed on any milking system. Material and construction shall meet 3A standards and have proper drainage.

Procedures for Cleaning and Improving Milk Quality

Equipment Cleaning and Sanitizing:

1. All equipment must be properly cleaned and sanitized with each use. Water should be checked for hardness, etc., and cleaning compounds recommended accordingly. For all equipment that has come in contact with milk product, it should be pre-rinsed with water of body temperature (90-100 degrees) and the CIP systems not recirculated on the rinse cycle.
2. For pipeline cleaning, use an approved chlorinated cleaner. The temperature of wash solution at beginning of wash cycle should be 165°F. Wash cycle should be 3-5 minutes and wash solution at end of wash cycle should not be less than 120° F.
3. For automatic tank washing, use an approved chlorinated cleaner formulated for automatic tank washing.
4. For all equipment washed manually, use a good brush and approved manual cleaner.



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5. For manual tank cleaning, use an approved manual cleaner. Mix wash solution in plastic pail not in tank (set pail in tank). Do not use pipeline cleaner.
6. Equipment may be rinsed with an acid rinse after each washing, using a spray unit for bulk tanks.
7. All equipment including bulk tanks must be sanitized before use with approved sanitizers and approved practices. A spray device is recommended for sanitizing bulk tanks.
8. Replace rubber parts (inflations, hoses and gaskets) as to manufacturers recommendations.
9. Recommend an approved dial type thermometer on the wash vat to monitor the temperature of the wash solution. (Recommendation only)

Cooling Requirements:

1. The bulk milk tank will cool the rated milk volume (according to 3-A Standards or equivalent) capacity of the tank to 50° F within one hour and 45° F within two hours after milking.
2. The temperature of milk shall not exceed 50° F when fresh milk is being added on the second, the third and fourth milking.
3. The milk from the first milking shall be of adequate quantity to provide sufficient agitation for proper cooling.



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4. Compressors should be properly protected during extreme weather conditions.
5. Milk precoolers on dairy farms shall be accessible for inspection. Producer shall provide necessary tools to disassemble the precooler for inspection.
6. Install interval timer on bulk tank agitator motor(s).

Cow Cleaning and Preparation:

1. All teats must be cleaned, sanitized and dried prior to milking. Pre and post dipping are highly recommended.

Developed by the Dairy Farm Methods Committee, Kentucky Association of Milk, Food and Environmental Sanitarians in cooperation with the KY Milk Safety Branch, Department for Public Health, Division of Public Health Protection and Community Safety, February 23, 1994. Revised February 3, 2005.