

# DAIRY GOAT MILKING FACILITIES

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## **Introduction**

Regardless of the size of a dairy goat operation, provision needs to be made for milking. Goats are generally housed in group pens and should be removed from that environment to be milked. A small herd may only need an isolated corner or area set aside for milking, whereas a commercial dairy would need a separate room often referred to as a milking parlor. The key to any system is that it be separated from bedded areas and easily cleaned and kept sanitary, and it must meet public health requirements if milk is commercially produced.

The most basic system is to use a milking stand for the goats while they are being milked. This separates the goat from the housing area and confines it, as well as providing an opportunity for individual grain feeding. A milking stand will suit the needs of smaller dairy goat farms and can be used for hand milking as well as with milking machines. A wooden milking stand can be adequate for home use, but on commercial dairies, all contact surfaces must be made from impervious materials such as concrete or steel.

A basic milking parlor can be set up with a series of milking stands placed side by side with space in between for the operator. They should be arranged in such a way that goats enter at one end of the room and exit at the other to provide for good animal flow. A pipeline can be mounted overhead with the goat being milked from the side or the rear.

## **Types of Milking Parlors**

Milking parlors are often constructed with a pit that puts the operator below the level of the goats to provide easy access to the udder; or the parlor can be an elevated platform which puts the animal at about waist level, and then the goats enter and exit by way of a ramp. The types of parlors listed below could be built either way.

### Herringbone Parlor

The herringbone parlor is commonly used with dairy cattle. There is a pit in the middle so the animals stand elevated to the operator at a 30° to 40° angle on both sides of the pit for easy access to the udder. With goats there could be a problem in properly positioning them and the short length of the animal

might make the angle less of an advantage. The pit should be 6' to 7' wide, and the working height of the animal platform needs to be custom-designed to the comfort of the operator to avoid bending, but often varies between 34" to 40" high. The animals enter and exit as a group, which makes efficient animal handling, but a slow milker will detain the whole string. For efficient traffic flow, there should be a holding area outside the parlor to hold animals close to the entrance and a well-defined exit alley to direct the animals back to the barn.

### Straight-Through Parlor

A straight-through parlor is similar to the herringbone, but the animals do not stand at an angle to the operator. They are lined up head to tail and enter and exit as a group. This makes positioning the animal easier and there is a short distance from udder to udder between goats, which provides for efficient handling of the milker unit. Often times headlocks are mounted on the side of the parlor next to the operator, and each goat stands with its head locked in place and its body parallel to the operator. With the goats' heads facing the operator, grain can be fed on the side next to the parlor pit, making an easy access for re-filling the grain boxes.

### Parallel Parlor

In the parallel parlor, the animals are elevated above the pit and stand parallel to one another, facing away from the operator on one or both sides of the pit. Only the rear udder is accessible, which is convenient but could be a problem for goats with non-symmetrical teat placement. The pit dimensions are similar to those outlined previously for the herringbone parlor, but the pit is sometimes deeper for easier access to the udder. With the animals standing parallel, more animals can fit in a space than a herringbone; however, additional space is needed in front of the animals so they can be exited out the front or off to the side by lifting the restraining bar. Provision needs to be made for collecting the urine and manure to deflect it from the milking area.

### Side Opening Parlor

The side opening parlor is another option for dairy goat operations. There is a pit similar to the ones described previously, but the goats stand in individual stall units which run parallel to the pit, with the animals in a line head to tail, often separated by a grain feeder. The animals can enter and exit at their own pace and not affect the rest of the animals. While individual stalls help in handling each goat as a separate unit, they do create more opening and closing of gates and there is a greater distance to walk from one milking unit to the next.

### Rotary Parlor

The rotary parlor can be more expensive and may add some more animal handling considerations to properly channel the animals onto the rotating parlor. These are set up for either the operator to be inside the pit with the animals rotating around them on a circular platform facing out, or the animals face the center of the circle and the platform rotates by the operators who work along the outside circumference.

These are mechanically propelled at a slow speed to keep the animals progressing around the circle to the exit as they complete milking. The platform can be suspended on water or on a metal track so it is easily rotated with a small motor. This type of parlor is more suited for large, commercial operations.

### Parlor Mechanization

There is a wide variety of equipment available which can be installed to mechanize a milking parlor operated on a large commercial scale. Some of these include:

- ! Automatic detachers - These units sense the milk flow and shut off the vacuum and remove the unit when milking is complete. There can be a flexible arm or a retractable cord, depending upon which type better fits the parlor design. These are used in dairy cattle milking parlors, but the expense is usually not justified with dairy goats.
- ! Crowd gates - A crowd gate can be electronically controlled to advance forward and keep the animals confined to a smaller area and encourage them to enter the parlor.
- ! Power gates and doors - Power operated entrance and exit doors can be opened and closed with pneumatic cylinders. This saves pulling ropes and having to walk from one end of the parlor to the other to open and close doors.
- ! Feed gates and feed bowl covers - These can be used in a parlor to prevent animals from stopping and eating as they walk past feed in mangers. Covers or gates can open in sequence as animals enter or close in sequence as they exit the parlor.
- ! Milk meters and recorders - Electronic and mechanical flow-through meters are available to record milk production on each animal. The data can be manually or electronically recorded and compiled to assist in herd management decisions.

### **Milking Parlor Construction**

The milking parlor should be a separate room but readily accessible to both the milk room and animal housing area. Consideration needs to be given to adequate drainage and proper joining of roof lines to maintain the slope needed to minimize snow loads. Milking parlors are humid areas due to the large amount of water used for cleaning, so construction materials and methods need to take this into account. Below are a few key points:

- ! There should be an 18" high concrete base wall to prevent rotting of the sills.
- ! Wood frame walls are recommended above the concrete, insulated to R-19.
- ! Inside wall and ceiling surfaces should be water resistant, cleanable, and smooth. Well-sealed fiberglass or plastic board is preferable to paint.

- ! Floors need to be relatively smooth for cleaning but have enough texture to be slip-free.
- ! Lighting should illuminate animals properly for milking.
- ! Floors should be sloped in one direction to a cross channel which slopes to a drain located in the corner.
- ! Ventilation and fresh air inlets need to be provided.
- ! Provisions need to be made for adequate electric and water supplies.
- ! There should be good animal flow in and out of the parlor.
- ! Parlor platforms are often 34" to 40" from the floor, depending upon the height of the operator.

### **Milking Equipment**

When several goats are being milked on the farm, it generally necessitates the use of milking machines. There are complete, self-contained milk units built for goats that include the compressor and milker unit on a portable stand. Care should be taken when purchasing some of these units to make sure they have adequate capacity for proper milking. New or used dairy cattle equipment can also be adapted to goats. The components are basically the same whether cows or goats are being milked, with the exception of the milker claw, which only needs two teat cups for goats; however, there are some equipment specifications that need to be modified for goats. (See Table 1)

**Table 1. Specifications for Dairy Goat Milking Equipment**

<u>Item</u>	<u>Specifications</u>		
Pulsation Speed:	60 - 85 pulsations per minute (ppm) <sup>1</sup>		
Milk to Rest Ratio:	50:50 to 70:30 <sup>2</sup>		
Inches of Operating Vacuum:	High line 13-14" Low line 11-13" Mid line 12-13.5"		
Minimum air flow requirements (extrapolated from cow data):	Bucket System -	Base	10 cfm
		Additional, per milking unit	2 cfm
	Pipeline -	Base	25 cfm
		Additional, per milking unit	2 cfm
Milk line:	A 1 ½" diameter stainless steel line can be used for up to 3 - 4 units per slope and a 2" line can handle 6 to 8 units per slope. Larger milking systems need to be designed according to manufacturers' recommendations.		
Clawless Units:	When using direct feed into the line without a milking claw, 3' of milk tube is needed between the inflation and the fork or joining device.		

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<sup>1</sup>Speeding up a pulsator designed to operate in the 45 - 60 ppm range used by cows to 85 - 120 ppm used by goats may not give the desired effect as the opening and closing times may take up too much of the cycle.

<sup>2</sup>50:50 is for simultaneous pulsation only.

The above specifications are just rough guidelines. A milking system should be carefully designed using the manufacturers' recommendations. A lot of the guidelines being used today are extrapolations from cow data, and more research needs to be done with dairy goats. A milking system needs to be laid out for efficient operation that is gentle on the animal, designed for proper cleaning and meets public health regulations. The goal is to produce quality milk to ensure a safe and high quality milk supply for the marketplace.

*The proper citation for this article is:*

*Porter, J. C. 1998. Dairy Goat Milking Facilities. Pages 25-29 in Proc. 13th Ann. Goat Field Day, Langston University, Langston, OK.*