

DAIRY GOAT JOURNAL

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System Explained**

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CoPulsation™ explained...

New Milking Technology Means Better Health for Goats

By JOHN HIBMA

The modern electric milking system supplies suction to the teat of the goat and, through a pulsation system, opens and closes a membrane that both squeezes and massages the teat in order to express the milk. The traditional pulsation design has drawn some criticism that, due to the uneven suction and massage inherent in the pulsator's design, causes unnecessary stress to the goat's teats and udder, sometimes resulting in poor milk let-down and mastitis. More recent technology, called co-pulsation, designed and marketed by The LR Gehm Company of Lisle, New York, claims to reduce the stress to teats and udders and has stimulated interest among goat owners.

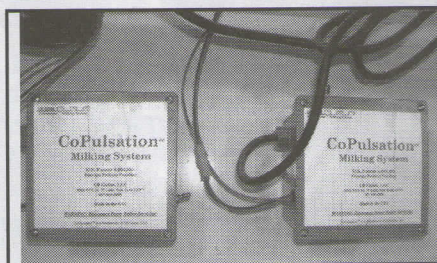
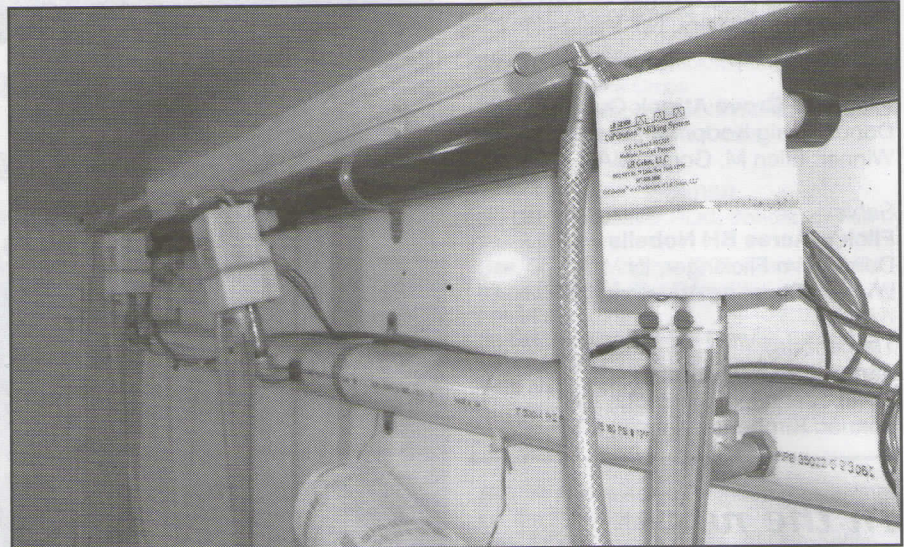
Pulsation systems essentially mimic the on-off action of hand-milking or nursing. Of course, what is really being done here, is subjecting the tender tissue of the mammary gland to automation that reduces time and labor. The natural function of nursing is being eliminated and milk is being taken from the udder by mechanical means.

The modern pulsator is an electromagnetic solenoid that opens and closes an airway between the liner membrane and teat cup. Much work has been done throughout the dairy industry to find the correct combination of suction (usually measured in inches of mercury) and squeezing by the liner in the teat cup without causing discomfort. One of the more pesky problems with modern milking machines is getting

the liner to collapse in an even manner across its entire length so that there is an even amount of pressure applied to the entire teat, rather than pinching just a portion of the teat. The second problem that many find challenging with teat cups is the "slippage" of the

teat cup as it milks. These problems can cause the lactating animal pain or discomfort and creates an opportunity for infection to get into the udder, possibly causing mastitis.

Lanny Gehm, along with his son, Bill, invented a new pulsator system



The three pulsators pictured above will milk six goats. The twin vacuum lines that come down from the pulsator connect to one milking machine and split off to the two teat cups, so two goats are being milked at the same rate with one pulsator. The unique design of the CoPulsation™ is seen on the backside of the pulsator—the black

plug-like fitting sticking out of the back is the larger airway that makes the liner work more smoothly. The black thing is actually a little air filter. You will notice the white PVC pipe is the vacuum supply to the pulsators—a normal setup. The black pipe above the white pipe is a second vacuum line that supplies the vacuum to the milking buckets so there is no chance of cross contamination of milk ever getting into the pulsator vacuum lines. Hall does not use a milk-pipeline in the parlor, he milks in buckets. You see the other larger air hose connected to the pet-cock at the black pipe coming down that connects to a bucket down below when milking. *Above left:* The two controller boxes for the pulsators. In Hall's setup one box controls two pulsators and the other controls one. *Photos by John Hall*

at their farm in New York, to combat the two well-known problems of the modern milk machine. Gehm said that conventional pulsation systems, due to their design, spend too much time “in transition” of opening and closing the liner. By allowing greater access to ambient air pressure, the Gehm’s CoPulsation system accelerates the transition from the rest phase to the milk phase and back again. This allows for less irritation and stress to the teat, and complete milk-out of the udder.

The copulsation system essentially improves the comfort of the goat during milking, preventing the swelling trauma to the end of the teat and teat canal that are the primary barrier to mastitis-causing organisms entering the udder. Gehm’s design also enables the teat to be milked dry—there is no backing up of milk up the liner during milking which leaves the teat wet during and after milking. Lanny Gehm said that most mastitis in goats and cows is caused by the stress and trauma from the milking machine. The gentle milking action and complete milk-out for goats with the copulsation system results in less stress and lower SCC counts.

John Hall owns and milks over 80 goats in Sharon Springs, New York. During the Fall of 2010 Hall installed Gehm’s CoPulsation™ system, hoping to reduce the SCC count in his herd. Hall said the SCC count in his herd, which was already well into late lactation, was over one million and in just a matter of 10 days after the new equipment installation, the SCC dropped to half that. In addition, the goats milked for another month beyond the expected dry-off time. As of June 2011 the SCC was 170,000, significantly lower than the previous summer. Hall said there was no question for him that the CoPulsation™ system was responsible for the improvement in his herd’s milk quality.

At the heart of a properly functioning pulsation system is the resting time for the teat. Much like hand-milking, there must be an adequate amount of



Two goats being milked by one pulsator.

time for opening and closing in order for the teat to become re-engorged. The Gehm’s CoPulsation™ technology accomplishes that function much more effectively than the conventional pulsation systems that have only a tiny orifice to allow for ambient air pressure in the shell. The pulsation rate is set at 75 beats per minute. That means the liner in the milk shell opens and closes 75 times each minute. The “phasing” of the pulsation is set at 60/40 meaning that for that fraction of a second that

the liner opens and closes, it is open for 60% of the time and closed for 40% of the time. Lanny Gehm prefers to have about 14 inches of vacuum at the teat end.

When the milking equipment is not working correctly goats will be miserable and not be willing to stand quietly and the entire milking process can be a frustrating chore. Unhappy goats will not milk out and end up drying up early. Many goat dairies struggle with keeping somatic cell counts (SCC) in their milk in the legal range. High SCC counts also decrease the cheese yield in milk. The CoPulsation™ technology appears to provide a solution to both milking comfort and reducing the occurrence of mastitis in goats, as well as an improvement in milk quality and lactation performance and overall profitability.

More information about CoPulsation™ systems is available at Gehm’s website, www.copulsation.com.

Quality Milk, Humane Milking

A conventional machine pinches the teat end causing pain, damage & reverse milking action you can feel with your finger. A New Zealand **university professor** recently **agreed**: “I understand the physics and the physiology and in fact, I teach the basics of machine action to vet students. I do invite students to put their finger in – usually only 1 or 2 at the front of the class do so. And none last 30 seconds.” In response to our suggestion of feeling the pain an animal endures he stated: **“Maybe it should be compulsory for all milkers to have 4 fingers ‘milked’ for at least 7 minutes.”** Contact us to discover the improved technology the CoPulsation™ Milking System will provide your herd and end the pain.



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