by Paris Reidhead

LR Gehm LLC markets a patented milking system designed to reduce intra-mammary infections ( mastitis ) in dairy cows, while providing a “unique humane milking action not duplicated by any other product.” It is called the CoPulsation Milking System (LR Gehm LLC’s trademark). This system may very well be the man-made device which comes closest to duplicating the natural nursing action of a calf on its own mother.

A Cornell University study has reported that the CoPulsation Milking System (LR Gehm LLC’s trademark) essentially eliminates new contagious *Staphylococcus aureus* mastitis infections when compared to a conventional milking system ( single-pulsation electric pulsators from Babson Bros-Surge, Westfalia-Surge, DeLaval). Reduced *S. aureus* infections of nearly 94% (comparing CoPulsation benefits to conventional milking) were “statistically significant.”

LR Gehm LLC has recently brought legal action against Cornell University. The complaint, filed February 23, 2009, alleges that Cornell continues to propagate false information based on a published university study that contained fraudulent information. The complaint further alleges that Cornell’s actions are harmful to LR Gehm LLC, dairy farmers, and dairy product consumers.

This study was titled “Evaluation of an Experimental Milking Pulsation System for Effects on Milking and Udder Health.” The author is D.J. Wilson et al., Quality Milk Promotion Services, College of Veterinary Medicine, Cornell University, Ithaca, NY. The study was published March 26, 2000 in Vol. 83, *Journal of Dairy Science*: 2004-2007. Despite the documented udder health benefit attributed to CoPulsation in the body of the research paper, the abstract and the discussion differed, with both stating, “differences in pulsation characteristics apparently have little effect on milking and udder health.”

I met with Lanny and Bill Gehm on March 25 at their Lisle, New York, business location. There I found that the research paper, which basically ignored its own findings, proved detrimental to the Gehms’ business. The paper had a little more tainted background than was evident at first glance.

**Research: Default by Design**

Back during the 1990s, Cornell showed, on behalf of utilities, that the stray voltage threshold for causing cow health issues was 5-6 volts. Gehm found that the fresh air path for a conventional pulsator is extremely restrictive and small. The Bou-Matic and Westfalia-Surge pulsators have a small-diameter opening at the top of the coil for the fresh air entrance. The fresh air must then squeeze around the plunger to get to the base of the pulsator. The DeLaval pulsator has an intricate series of passages and very small diameter holes, one of which is shown above. The CoPulsation™ Milking System pulsator has a very large-diameter fresh air hole entrance with no restrictions for the flow to get out of the pulsator.

The conventional designs are so restrictive that the fresh air supply to the shell is grossly inadequate and results in an incomplete liner rest action that simply pinches the teat. The CoPulsation’s Milking System pulsator provides proper fresh air flow to enable the liner to fully massage the teat and provide a true resting of the teat canal by fully removing the sucking action during the rest phase.

**Enter Irish Research**

Sometimes it’s necessary to leave the country to find the truth. There have been numerous published studies documenting the effect of milking action on the cow’s teat. A study published in the Irish Veterinary Journal documents such injury occurring when cows are milked with typical modern milking machines. (Refer to “Machine Milking,” *Irish Veterinary Journal*, Volume 56, January 2003.)

**Pulsator Design Comparisons**

**Fresh air supply features**

- **Bou-Matic**
- **Westfalia-Surge**
- **DeLaval**
- **CoPulsation**

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Transfer of Staph. aureus Infections

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This study evaluates the changes in the teat structure after being milked with conventional wide- and narrow-bore liners, and the associated typical U.S.-style conventional pulsation, as well as the Irish Dairy-Master pulsation.

Cows milked with conventional systems (both U.S. and Irish) experienced teat swelling. Cows milked with the CoPulsation Milking System consistently experienced a reduction in teat size, because there is no swelling, and therefore the teat and teat canal are not stressed or damaged by the milking process. (Refer to “Effect of liner design, pulsator set-up, and canal are not stressed or damaged by the milking vacuum.”) Cows milked with the CoPulsation Milking System are very concerned about the real possibility of infections which are not with CMS. The inside of the teat canal does not swell. The standard ratio of vacuum to rest with a CMS milking system is 60:40. (Many of the conventional systems, according to the research paper, use a 55:45 ratio.) CMS still employs that 60:40 ratio, but the rest phase is, basically, more restful. Bill likened it to numbers in a blood pressure reading.

Milkling machine vacuum is, granted, negative pressure... while blood pressure readings are positive. So it is obvious that the likelihood of teat sinus injury increases with inadequate rest during the rest phase of the vacuum cycle.

Published data involving (university) herds show that their animals do not experience the success rate, in terms of freedom from mastitis, which the colleges recommend and have determined to be attainable. CMS opens the teat 40% less and milks 20% faster. The vent hole on the CMS claw is 0.062” vs. 0.040” on a conventional claw; the greater diameter opening enhances air volume movement. Air intake is significantly less restricted with the CMS claw than with conventional pulsation. The one solenoid controls the fresh air supply to the shell. The one solenoid controls the fresh air and vacuum supply to the shell. The one solenoid controls the fresh air admittance and the other the vacuum. The one solenoid must be closed prior to the other being opened. This design prevents the mixing of fresh air and vacuum such as occurs with conventional pulsation. The design also enables the fresh air port to be substantially larger than other pulsators’ air ports. This allows the fresh air to enter the pulsator without squeezing around the solenoid plunger. The net result is to move air and vacuum in and out of the shell two to three times faster than conventional pulsators.

The rapid movement of fresh air into the shell during the rest phase causes the liner to collapse differently than with conventional systems. The liner collapses in a manner that results in a compressive massaging action on the full length of the teat; it also relieves the teat canal from the milking vacuum. A conventional pulsator is only capable of causing the liner to flop to the end of the teat and fails to relieve the milking vacuum.

Cows are farmer friendly – very little outside management is required. Competing equipment companies (Surge, DeLaval, etc.) have told their dealers, “If you take on CMS, we’ll shut you down.” Thus it is fairly evident that existing milking equipment companies are very concerned about the real possibility of their products being upset by CoPulsation. CMS has evolved from over 25 years of experimentation. The Gehms sold their dairy herd in 1993, and have since then devoted their energies to the research, development, and marketing of CoPulsation.

How CoPulsation’ Milking Works

Let me briefly discuss the unique features of the CoPulsation Milking System. (Refer to www.CoPulsation.com.) The basis of the CoPulsation™ Milking System performance is the unique pulsation design. This pulsator has two independent solenoids for controlling fresh air and vacuum supply to the shell. The one solenoid controls the fresh air admittance and the other vacuum. The one solenoid must be closed prior to the other being opened. This design prevents the mixing of fresh air and vacuum such as occurs with conventional pulsation. The design also enables the fresh air port to be substantially larger than other pulsators’ air ports. This allows the fresh air to enter the pulsator without squeezing around the solenoid plunger. The net result is to move air and vacuum in and out of the shell two to three times faster than conventional pulsators.

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The Bigger Picture: S.A. to MRSA

Let me close by spotlighting a health issue which encompasses livestock and humans:

At the time the Cornell study was published (March 2000), Staphylocococcus aureus was already a very difficult microbial nemesis plaguing dairy farmers attempting to fight mastitis. Dunning down research which proved that there exists a manage- ment tool which virtually eliminates new cases of S. aureus was intolerable.

In the U.S. more antibiotics are used on livestock than on people. Over-reliance on antibiotics in livestock, dairy cattle included, has forced pathogens (like S. aureus) to genetically mutate so as to develop resistance to antibiotics, such as methicillin. These organisms survive in liquid manure systems which are increasingly common in feedlot situations, where hogs, beef cattle, and dairy cattle are managed. Antibiotics in liquid manure degrade only minimally. S. aureus is not very heat sensitive, and therefore the endotoxins, produced by S. aureus, are not all destroyed by the high-temperature short-time pasteurization process. So if a cow is infected with S. aureus, some of this pathogen will make it into her milk.

In more recent years, a mutated form of S. aureus has become a human medicine concern, com- monly called MRSA (methicillin-resistant S. aureus). It is now known that this pathogen can move between humans and cows, with both species now serving as hosts. The immunity of S. aureus to antibiotics has proven fatal to thousands of sick people. The federal Centers for Disease Control documents that over 18,000 Americans died from S. aureus infections during 2005. Because of the new human health threats, continuing to suppress research documenting the anti-staph trait of a milking system is not just intolerable and unethical... it’s unconscionable.

NFDM Lawsuit Amended: All FMMO Producers Now In

The March 2009 issue of The Milkweed featured an article on the legal complaint filed regarding the misreporting of price data to National Agricultural Statistics Service (NAS/S) by DairyAmerica. Two years earlier, in the March 2007 issue, The Milkweed revealed the details, which were later confirmed by USDA, of illegal low-ball pricing of nonfat dry milk used in the NASS survey. DairyAmerica had illegally included low, long-term prices, costing farmers millions upon millions of dollars.

The lawsuit, filed in U.S. district court, Fresno California by the Washington, DC-based law firm Cohen, Milstein, Sellers and Toll PLLC, is a class action case covering dairy farmers in 25 states. The original legal complaint stated:

“This class action is brought on behalf of dairy farmers located in Wisconsin, Pennsylvania, New Mexico, Minnesota, Texas, Michigan, Washington, Ohio, Iowa, Arizona, Vermont, Colorado, Kansas, Illinois, Missouri, Georgia, Kentucky, South Dakota, Tennessee, Nebraska, North Carolina, Oklahoma, Maine and California who sold raw milk that was priced according to a Federal Milk Marketing Order ("FMMO") during the period January 1, 2002 through April 30, 2007.”

Since the original filing the complaint has been amended and now will cover all dairy farmers in all states which operate under the federal milk market orders. Additionally, three more, virtually identical, lawsuits have also been filed in Fresno District Court.