The JennyLynn Flow Simulator

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Accurate recordings of vacuum levels and vacuum fluctuations during milking provide the best means of demonstrating the adequacy of any milking system. However, anyone involved in on-farm testing of milking equipment realizes the challenge in picking the "right cow" to check during milk time evaluations. Simply having a stranger in the parlor or the barn with test equipment will often upset the normal milk letdown and interfere with the flow rate on some cows identified as fast milking individuals. The JennyLynn Flow Simulator was developed to allow testing to be done in a controlled situation where the flow rate is known and repeatable.

The artificial teat installed on the JennyLynn Flow Simulator has been fabricated to meet the ISO/DIS standards for artificial teats. These standards were certified by an ISO/DIS committee in a paper dated May 14, 1994. The test teat has a six (6) millimeter tube opening through the teat and extends 7 mm past the end of the teat with an additional thirty (30) millimeter extension of flexible hose which collapses during the closed phase of normal liner movement.

The JennyLynn Flow Simulator can clearly show the average vacuum level under various flow rates in milking equipment as it is set up in barns and parlors. It is extremely important to be sure accurate connections are made to the milking equipment to achieve repeatable results. Claw vacuums can be measured in one of three ways. Several manufacturers provide claws that have test ports installed on them which can be used in place of claws actually found in a particular milking system. Another method to get an accurate claw vacuum level is to push up the stem of one of the inflations approximately one-half (.5) of an inch. A two and one-half (2.5) inch long twelve (12) gauge needle can then be inserted into the stem of the liner and placed so that the needle is into the top area of the claw bowl. Another more common test method is to insert a tee directly in front of the claw outlet in the milk hose. These tees are available with both 9/16 and 5/8 inch inside diameters from Dairy Test Equipment company, 1458 Euclid Avenue, Chino, California 91710. Dairy Test Equipment's phone number is (909) 628-6744. It is important to realize that when using the tee piece between the milk hose and the claw outlet, this location can indicate vacuum level reliably but may distort the amplitude of claw vacuum fluctuations. Remember, good connections are important for reliable test information and repeatability of results in various barn situations.

The National Mastitis Council Machine Milking Committee published guidelines for evaluation of vacuum levels and airflows in milking systems at the 1995 NMC meeting. The recommendation of this committee is that vacuum should be set on milking systems that result in a mean flow vacuum within the range of ten and one-half (10.5) to twelve and one-half (12.5) inches (35 to 45 kPa) for a representative sample of cows. Field experience has shown that when claw vacuums under peak milk flow range are between eleven and three-quarters (11.75) and twelve and one-half (12.5), unit on-time decreases significantly and, in many cases, teat end condition improves. Lower mean values may indicate low vacuum in the system, excessive milk lift, restrictions in milk hoses, air leaks into the claw or milk hose, or excessive vacuum drop across ancillary equipment. Milk time analysis should also evaluate vacuum fluctuations at or near the claw during peak milk flow rate periods. The goal is to have average fluctuations of less than two (2) inches in a lowline system and less than three (3) inches in a highline system.

The JennyLynn Flow Simulator is normally used to test the system at one gallon and at one and one-half gallons per minute flow rate. One gallon per minute, or eight pounds, is an average milking cow. Research has indicated that fast-milking cows will milk at the level of 12 pounds per minute for certain periods during some milkouts. Utilizing the JennyLynn Flow Simulator either before or after milking allows interaction with the milk producer at a time when milking is not occurring. The attention of the manager and/or milker is directed at what is actually being tested and not about completing the tasks associated with normal milking. In addition, the JennyLynn is an excellent education tool to show different levels of vacuum achieved in the claw when certain components are either by-passed or left in place and shorter or longer milk hoses are used during testing. There are excellent example graphs in the National Mastitis Council's 1996 meeting Proceedings to allow operators of the JennyLynn to become familiar with what type of changes can be expected due to various hose and lift configurations found in normal milking systems.

The JennyLynn Flow Simulator can be used to evaluate existing equipment in any dairy barn under varying flow rate conditions. The system vacuum can then be adjusted to maintain the average claw vacuum

levels within the parameters suggested by the NMC Machine Milking Committee recommendations. Testing can be done at several locations in the milk hose simultaneously to evaluate vacuum drop across specific components between the claw and the milk line.

Physiologic parameters to predict milk yield following clinical mastitis in dairy cattle

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A cohort study was designed to evaluate the physiologic response of cows to naturally occurring coliform mastitis. Measured physiologic parameters were used in a model to predict subsequent mature-equivalent 305-day (ME305) milk production. In particular, the study was directed to determine: 1) the association of coliform (*E. Coli* and *Klebsiella sp.*)and gram positive (coagulase negative *Staphylococcus* and *Streptococcus* non-agalactiae) mastitis and subsequent liver cell damage by measuring serum sorbitol dehydrogenase (SDH), 2) the effect of coliform and gram positive mastitis on peripheral blood white blood cell counts (WBC) and packed cell volume (PCV), and 3) the value of physiologic parameters to predict the production outcome of a case of clinical mastitis. Over a one-year period, complete bacteriologic, production, and physiologic data were collected on 78 cases of clinical mastitis (22 coliform, 22 gram positive, 34 no growth). Using multiple linear regression analysis, predictive parameters from day 5 after clinical case were seen in cows with coliform and gram positive mastitis. These included SDH (increases were associated with higher ME305), WBC (increases were associated with higher ME305), and PCV (increases were associated with decreased ME305). Such a model could be useful to dairymen and veterinary practitioners in estimating a prognosis for a cow's recovery to profitability.

A placebo-controlled trial of an Escherichia coli J5 bacterin and the ribotyping-based assessment of coliform bacteria diversity on a dairy farm.

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To evaluate the efficacy of an experimental *Escherichia coli* J5 bacterin to prevent natural occurring clinical coliform mastitis (CCM) in dairy cows during a whole lactation period, and to determine which of the three proposed immunization schedules was associated with a higher protection against CCM, we conducted a randomized, double-blind, placebo-controlled clinical trial on a commercial dairy in central New York State. Furthermore, bacteria isolated from clinical cases were assessed by automated ribotyping. Holstein cows (n=240) were administered either the bacterin (whole cell of *E. coli* J5 plus metabolizable oil as adjuvant, n=180) or the placebo (saline plus adjuvant, n=60) in the supramammary lymph node region. The immunization or placebo dose administration schedules compared were: **1**, at 7, 8, and 9 month gestation; **2**, at drying off, 4 weeks later during the dry period, and at calving; **3**, at drying off, at calving, and at 90 days in lactation. The period of surveillance for cows in the trial began immediately after calving and continued for the entire lactation (range= 262-305 days). A total of 50 cows, 23 immunized and 27 controls, were diagnosed as